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Published by
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PENTON BUILDING
CLEVELAND, O.

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Berlin . . Berlin, N. W. 40, Roonstrasse 10

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada, one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

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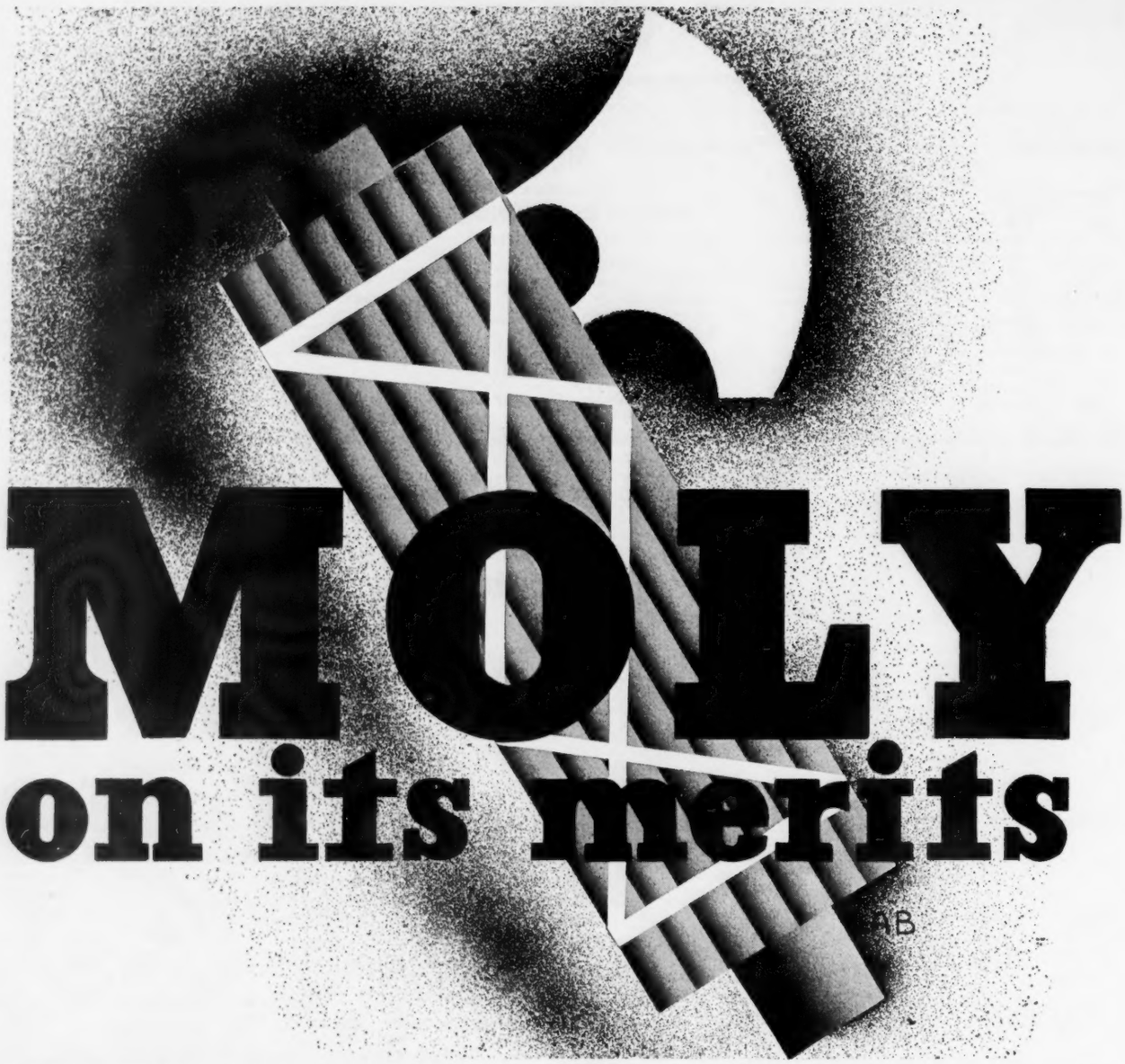

WHEN a user wishes steel for any particular application, he considers the physical properties which the steel must have. He usually has a choice of several steels. The consideration then quite logically narrows down to the *most economical* steel with which to meet the requirements.

For practically every known application, a Molybdenum-containing steel is available which is more economical than any other type of alloy steel. A broad claim? Yes. But a claim that is based, not on laboratory tests alone, not on isolated instances of practice — but invariably on repeated proofs in manufacture and in service . . . *on the merits* and general recognition of Molybdenum's outstanding qualities.

With "Moly" having, in the past few years, so broadly affected costs and service standards, it is a wise move of the manufacturer of alloy-steel products or the user of alloy-steel equipment and tools, to review his requirements; to consult the Climax engineers; and to learn for himself how money can be saved by standardizing on the more economical Molybdenum-containing steel having physical properties at least equal to what he is now using.

Continual Molybdenum developments have led to the publication of our house organ, "*The Moly Matrix.*" A word from you puts you on our mailing list. A further request brings you these interesting books: "*Molybdenum in* 1934" and "*Molybdenum in Cast Iron* — 1934 *Supplement.*" And for any alloy problem peculiar to your business, the services of our metallurgists and Detroit experimental laboratory are open to you. Climax Molybdenum Company, 500 Fifth Avenue, New York City. (In Canada: Railway & Power Engineering Corp., Ltd.)

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As the Editor Views the News

AMERICAN manufacturers shortly will be forced to pay higher freight rates. The decision of the interstate commerce commission (p. 9) authorizes emergency increases in response to the railroads' request for additional revenue to offset higher operating costs, including particularly the restoration of earlier wage reductions. Here is a clear-cut illustration of how the expense of wage increases, pensions, job insurance, etc. eventually is thrown upon the shoulders of the public. When the man in the street realizes that he is the one who pays the bills, the schemes for pouring out money through government channels will lose the charm they have enjoyed during the Cinderella period.

• • •

Release Brakes on Recovery!

One seldom finds two independent documents which fit-together as nicely as the MAPI survey of the country's potential machinery requirements and Ernest T. Weir's appeal to business men to counteract the hamstringing activities of the government. MAPI shows that machinery to the value of $18,000,000,000, affording jobs for 4,000,000 men for two years (p. 8), is required and would be bought if sound government policies were adopted. Mr. Weir, in a stirring call for action (p. 11), urges business executives to fight the influences which—in destroying confidence—withhold the key that would unlock the door to this potential business.

• • •

How Open Price System Works

Critics of the open pricing system, who have been asserting positively that it throttles competition, permits price-fixing, etc. should study the recent reduction of quotations on cold-finished bars. Late in March a small non-integrated producer filed a price $3 below the current market. Because of the limited output of this small seller, many consumers and producers did not expect that the lower price would affect the market seriously. However, by April 1 another interest had filed the new price and subsequently other producers fell in line. As a result, on April 10 the reduction of $3 for cold-finished bars (p. 64) will become effective generally. This refutes the contention of critics that the open pricing system throttles price competition. It also weakens the force of their argument that the large, integrated producers always control price movements.

• • •

This Is an Inside Job!

Scanty bookings during the depression have fanned the embers of discord caused by seller-customer competition until they have burst into flame (p. 10) in an important branch of the steel industry. This should be a warning to executives in every division of the metalworking field where companies function in the dual role of vendors and competitors. It should emphasize the danger of temporizing with the problems of this practice and should drive home to executives the fact (p. 19) that negotiation within the councils of industry—even if it involves painful concessions from both sides—is much better than permitting a deadlock to occur which inevitably will throw the case into the hands of a politically-minded government agency.

• • •

How To Save $18,000

Manufacturers who operate enameling departments will be interested in the economies afforded by the enamel reclaiming system (p. 28) in modern spray booths. Reclaiming 98 per cent of the enamel ordinarily exhausted through the stack means a saving of about $18,000 annually in an average shop. . . . Suppliers of gray iron castings for the automobile industry will check the new specifications of the Society of Automotive Engineers (p. 32), in which important revisions have been made. . . . Automobile output last week was stepped up to 107,895 units (p. 14), highest weekly total since August, 1929. STEEL's index of activity (p. 20) has touched a new high for the present cycle. Pig iron output in March was up 9 per cent (p. 50), but the average daily rate declined slightly to 57,120 tons.

E. L. Shaner

MAPI Says 18 Billions for Equipment Await Confidence

POTENTIAL machinery requirements of the United States which would mature "with a sound governmental policy and restored confidence" reach the staggering total of $18,574,632,000, states the Machinery and Allied Products institute (MAPI).

Of this sum necessary to modernize American plants—a sum exceeding the pre-war debt of the nation—65 per cent or $12,073,000,000 would accrue to labor. It would provide work for 4,000,000 men for two years.

Foundry and machine shop products alone account for 39 per cent of this total of almost 19 billions, or $7,299,830,376. In order come electrical machinery and apparatus; engines, turbines, tractors and water wheels; then machine tools and agricultural implements.

This estimate by MAPI, based upon a survey conducted through members of the 58 trade associations comprising it, each of which covers its separate industry and is representative of at least 85 to 90 per cent of the volume of industry production.

Prompting the survey is the hope of awakening Washington and the new deal to the necessity for removing uncertainty and creating an atmosphere of assurance that will unlock pent-up demand for equipment, particularly to overcome obsolescence, and also to equip plants for the manufacture of new products.

And, MAPI emphasizes, its statistics are of machinery requirements alone. They take no account of the dammed-up flood of equipment business existing in industries apart from machinery.

They do not include, for example, the broad equipment needs in other durable goods industries, such as housing for 1,000,000 families, necessary rehabilitation of 16,000,000 houses, requirements for industrial housing estimated at $1,000,000,000, and other construction needs—all totaling $11,000,000,000 and more.

Obviously, were this tidal wave of modernization of American industrial plants to break upon the industries whose business it is to equip them, the latter would be utterly swamped.

Needs Are Classified

These builders of machinery which would be utilized in manufacturing the machinery needs of industry themselves would have to purchase $45,377,402 worth of equipment. Of this over $31,000,000 would be devoted to new machine tools.

By percentages, the types of machinery which builders of equipment would buy with this $45,377,402 are as follows:

	Per Cent
Miscellaneous machine tools* .. (not otherwise listed)	12.00
Lathes	11.00
Motors (electrical)	9.23
Machinery other than machine tools (not otherwise listed)..	8.83
Milling machines	7.38
Turret lathes	5.74
Boring mills	5.45
Power plant and boilers	4.93
Drills and drill presses	4.32
Surface grinders	3.08
Welding equipment	2.88
Handling equipment—trucks ..	2.85
Tool grinders	2.72
Radial drills	2.28
Planers	2.15
Hoists	2.01
Cranes	1.92
Cylindrical grinders	1.78
Gear cutters	1.64
Shapers	1.43
Power transmission	1.31
Presses (mechanical and hydraulic)	1.02
Heat treatment equipment	.92
Key seaters	.85
Generators—electric	.85
Polishing lathes	.78
Internal grinders	.65
	100.00

*Too great a number to itemize in this statement.

Cogent reasons why machinery should be purchased now are given as follows by MAPI:

Prices are now at their lowest; machinery cannot be sold for less than it sells for at the present time. Increased demand in any line of industry inevitably is accompanied by rising prices; to this inflexible working of the law of supply and demand the machinery industry is no exception.

Funds. Fortunately some firms have liquid funds drawing at best a low rate of interest, or none at all; these funds could be better invested in your own plants. Some of these funds may be made up of your depreciation reserves. Furthermore, credit is becoming easier.

Skilled mechanics to build and install machinery are more plentiful now than they will be later. Surprising as it may seem, skilled labor is drifting away during these depression years to other occupations, only to find they have lost much of their skill on returning to their old jobs.

Machinery can be installed now without disturbing plant routine. The time required to install new foundations, for instance, and the consequent disturbance to plant operation mean relatively little in slack operating periods, but constitute a tremendous handicap in a time of flush demand.

Keep men on the payroll busy. Many manufacturers have retained on their payrolls competent men for whom they really have had insufficient work. These men can invest full time in removing old machinery and aid in the installation of new—a direct saving.

No delay in delivery. Machinery usually is of special order and design and not available from stock; generally it is manufactured to order upon plans and specifications. During quiet times orders are given immediate attention and delivery is prompt. To expect prompt delivery when plants are busy is to court disappointment, delay in production and, in many cases, loss of business.

Productive efficiency. We must face the fact that taxes will not be lower—not soon—but that they are bound to be higher; because production costs are climbing upward daily, codes, old-age pensions, unemployment insurance, maternity welfare and other items which mark the progress of time will have their effect on rising costs.

Preparedness. Most urgent, will be the necessity of decreasing costs. Plants not efficiently equipped cannot expect to secure business from competitors who, because they have modern machinery, are able to get the most out of each invested machinery dollar. Those operating under old processes with worn-out or obsolete machinery cannot fail to be undersold continuously. Also, we should be becoming conscious of the need for for-

Potential Machinery Needs Of All Industry

Item	Requirements	Per cent of total
Agricultural implements	$731,840,500	3.94
Electrical machinery, apparatus, etc.	6,060,902,123	32.63
Engines, turbines, tractors, water wheels	1,203,636,153	6.48
Foundry and machine shop products	7,299,830,376	39.30
Machine tools	724,410,648	3.90
All other machinery	2,554,011,900	13.75
Total	$18,574,632,000	100.00

Machinery Makers' Wants For Revamping Own Plants

	Purpose		
	Replacement	Additional	Total
Mach. tools	$15,471,482	$15,678,549	$31,150,031
Electrical equipment	1,789,511	1,543,416	3,332,927
Handling, service	891,439	1,542,768	2,434,205
Power plant, boilers	1,831,373	679,998	2,511,371
Other machinery	3,926,184	2,022,684	5,948,868
Total	23,909,989	21,467,413	45,377,402

eign trade; to get our share we must decrease production costs to balance the lower labor standards and wages in European countries.

John W. O'Leary is president of MAPI, with headquarters at 221 North LaSalle street, Chicago.

Steel Gathering Impetus —Taylor

STEEL industry is fast gathering an impetus which should sweep away "unsound policies engendered by past prosperity as well as quack notions borne of the depression" declared Myron C. Taylor, chairman of the United States Steel Corp. at the thirty-fourth annual meeting of stockholders in Hoboken, N. J., April 1.

An attempt to heckle Mr. Tayor on the ground that the Corporation's employe representation plans were designed to circumvent collective bargaining proved abortive. Asked if the Corporation had contributed to help a competitor fight NRA (referring apparently to Weirton) Mr. Taylor replied, "Not a cent."

To the observation that the average annual income of steelworkers in Pennsylvania last year was only $800, Mr. Taylor declared that over 10,000,000 Americans last year were entirely without income. A motion that the Corporation deal only with outside labor organizations was not seconded.

The stockholder was held up as the "forgotten man" these days.

For pertinent data of the Steel Corp.'s operations last year, see STEEL for March 11, p. 16.

New Capacity

NATIONAL STEEL CORP., Grant building, Pittsburgh, last week awarded to the Mesta Machine Co., Pittsburgh, the contract for a wide continuous strip-sheet mill for installation at its Great Lakes Steel Corp. division at Ecorse, Mich., just below Detroit. This confirms rumors of long standing. If cold rolling equipment is included, as expected, the cost will probably exceed $12,000,000. Plans for the building housing the new mill, which will be of the 79-inch 4-high type ,are well under way at Ecorse.

COLD TIN MILL FOR REPUBLIC

Republic Steel Corp., Youngstown, O., last week inquired for a 42-inch reversing 4-high cold mill for its Warren, O., division. With coilers and work rolls driven, the estimated cost of this improvement is $300,000.

Freight Rate Rise Boosts Steelmaking Costs 50c a Ton

FREIGHT rate increases of 20 to 40 cents per net ton on finished steel, 40 to 45 cents per gross ton on pig iron, scrap and semifinished steel, 3 to 15 cents per net ton on coal and coke and 11.2 cents per gross ton on iron ore will shortly accrue to most consumers as the sequel to the interstate commerce commission decision in rate case ex parte 115, issued March 30.

Steel's Nestor

Charles M. Schwab, chairman of the Bethlehem Steel Corp., is shown above returning March 28 from a business trip to Europe. Questioned about the manufacture of munitions, he said Bethlehem was glad to be out of it. Contrary to his normally suave optimism, Mr. Schwab was a little apprehensive concerning the trend of business, but "went long" on America for the long pull. Wide World photo.

In this proceeding, instituted last fall, the railroads requested a blanket increase of 10 per cent, calculated to net them $170,000,000 annually, principally to meet the cost of restoring wage reductions. The new rates, designated emergency ones to apply 24 hours after filing and be effective to June 30, 1936, are expected to provide about $85,000,000.

On the customary basis of two tons of iron ore, a ton of coke, plus limestone and other raw materials, the cost of producing pig iron will be increased 40 to 45 cents a ton. Considering that scrap is added in the openhearth furnace, the additional cost of steel at the ingot probably will be slightly over 50 cents a ton.

The alternative confronting producers of iron and steel is to absorb the additional burden or increase prices, and the latter could not be accomplished until July 1 inasmuch as the steel code prohibits any advance in a quarter. The new freights will be effective within a week, if the railroads speed the filing of tariffs, but the market is pegged for this quarter. Since the steel code makes prices quoted to consumers the sum of the base plus the freight, buyers immediately feel the effects of the ICC decision.

Increases Not Mandatory

Specifically, the increases ordered by the commission applicable to iron, steel and allied materials are:

Finished steel, semifinished steel, pig iron and scrap. 7 per cent with a maximum of 2 cents per 100 pounds, this maximum figuring to 40 cents per net ton on finished steel, and 45 cents per gross ton on semifinished, pig iron, and scrap.

Iron ore. 10 cents per net ton, to be applied once.

Coke and coal. Where present rate is 75 cents or less per net ton, 3 cents; 76 cents to $1, 5 cents; $1.01 to $1.50, 10 cents; over $1.50, 15 cents.

Pending the filing of tariffs and a study of them, many points will remain obscure. The disposition of fractions is unknown. The increases are permissible, and where truck or water competition is stiff they may not be applied. An additional permissive 10 per cent rise may be applied to switching, literage and other service charges.

Iron ore presents many complications. Presumably ignorance of actual conditions leads the ICC to state the increase of 10 cents in net tons;

ore is always calculated on a gross ton, hence the advance is 11.2 cents per ton. It is understood that the upper and lower lake roads may make a division of the higher charge. Every ton of ore moved after the effective date of the new rates will be subject to the increase, whether it is on lower lake docks or in upper lake dock pockets.

The application shortly of advanced freight rates is likely to have a noticeable effect on the Pittsburgh iron and steel scrap market. It can be foreseen that a tightening influence can result, for Pittsburgh has been drawing heavily on distant sources of scrap supply such as Oklahoma, Kansas, Texas and New England points.

Even though the surcharge is limited to 40 cents a net ton, it is likely to divert some of these western supply sources to other consuming points. Recently there have been heavy tonnages of cast scrap, rails and No. 1 heavy melting steel moving in from Texas, Oklahoma and Kansas by all rail.

On scrap originating in New England, with a $5.70 freight rate to the Pittsburgh district, the same diverting influence is likely to be felt. One of the first items to be so affected would be machine shop turnings which normally move in fairly heavy volume from New England points of origin to the Pittsburgh district.

Effects in Eastern Markets

In the East, the effect of the prospective increases will be to lift finished steel quotations 1 to 2 cents delivered New York, Philadelphia, Boston and other points. Pig iron to these points will be advanced 10 to 16 cents per ton, billets delivered Philadelphia will be increased 37 cents to $32.67.

Consumers of finished steel in the Detroit area, the largest in the country, will universally have to pay 2 cents per 100 pounds more for material originating in the Pittsburgh, Chicago, Weirton and southern Ohio territories.

Following are some comparisons of present freight rates and proposed advanced ones giving effect to the emergency surcharge. These are computations on the basis of present rates; definite rates are not yet available:

FINISHED STEEL
(Cents per 100 pounds)

Pittsburgh to	Present	Proposed
Detroit	26.5*	28.5*
New York	33	35
Philadelphia	29	31
Cleveland	18.5	21
Cincinnati	26.5	28.5
Boston	40	42

*Equalization allowed on Detroit delivered prices.

Chicago to		
Detroit	25	27
St. Louis	22	23.5
Indianapolis	21	22.5
Twin Cities	30	32
Cincinnati	25.5	27.5
Milwaukee	8.5 to 12	9 to 13
Flint	24	25.5
Cleveland to		
Toledo	17	18
Detroit	20	21.5
Youngstown to		
Cleveland	12	13
Toledo	20.5	22

BILLETS
(Per gross ton)

Chicago to		
Detroit	$3.78	$4.04
St. Louis	2.64	2.82
Milwaukee	1.00	1.07
Cincinnati	3.78	4.04
Indianapolis	3.02	3.23
Twin Cities	3.52	3.76
Cleveland to		
Toledo	2.65	2.84
Detroit	3.02	3.23
Youngstown to		
Cleveland	1.89	2.02
Toledo	3.02	3.23
Pittsburgh to		
Cleveland	2.90	3.11
Toledo	3.65	3.91
Detroit	4.28	4.58

PIG IRON
(Per gross ton)

Cleveland to		
Toledo	$2.25	$2.41
Detroit	2.75	2.94
Youngstown to		
Cleveland	1.76	1.88
Toledo	2.65	2.84
Pittsburgh to		
Cleveland	2.65	2.84
Toledo	3.15	3.37
Detroit	3.60	3.85
Chicago to		
Milwaukee	1.00	1.07
Tri-Cities	1.76	1.88
Rockford	1.39	1.49
South Bend	2.05	2.19
Muskegon	2.90	3.10
Peoria	1.54	1.65

COKE
(Per net ton)

Pittsburgh to		
Cleveland	$2.05	$2.20
Cincinnati	2.85	3.00
Detroit	2.85	3.00
New York	4.54	4.69
Chicago to		
Milwauke	1.65	1.80
Tri-Cities	2.10	2.25
Peoria	2.10	2.25
Rockford	1.65	1.80
Muskegon	2.35	2.50

DELIVERED PRICES IN EAST

Plates	Present	Proposed
New York	2.08c	2.09c
Philadelphia	1.98c	1.99c
Boston	2.20c	2.22c
Shapes		
New York	2.055c	2.065c
Philadelphia	2.005c	2.01c
Boston	2.185c	2.205c
Bars		
New York	2.13c	2.15c
Philadelphia	2.09c	2.11c
Boston	2.20c	2.22c
No. 10 Hot Rolled Sheets		
New York	2.18c	2.20c
Philadelphia	2.14c	2.16c
Pig Iron		
Basic, Philadelphia	$19.76	$19.81
No. 2 northern fdry., Philadelphia	20.26	20.31
No. 2 fdry., northern del. Newark	20.89	20.99
do del. Brooklyn	21.77	21.93

Fabricators Urge Probe of Bids

A SPECIFIC instance in which mill fabricators are claimed to have submitted bids involving a loss of as much as $10 a ton has been cited to the federal trade commission by the Central Fabricators association, Chicago.

This is in the form of a supplement to the memorandum which the association submitted to the commission last December, protesting against the position of independent fabricators in competing with those fabricators which are affiliated with a producer of plain material.

The original memorandum recommended the complete and real separation and disassociation of mill fabricators from their respective affiliated mills.

The particular project to which the association lately has taken exception is an Illinois state highway bridge. Cost of material for this work, based on iron and steel code prices, is given as $64,707, to which is added a direct labor fabricating cost of $3512, making total material and direct labor cost of $68,385.

Bids at Variance

Bid of the American Bridge Co., the low bidder on this job, is reported as $67,044. Adding to the direct cost indirect labor and shop expenses and administration and selling expenses, the association indicates a total loss of $13,676, or about $10 per ton for the 1400 tons involved in the work. Independent companies were 16 per cent above the lowest bid submitted.

In addition to calling the attention of the federal trade commission to the difficulties of the independent fabricators, the Central Fabricators association also has requested the senate committee on banking and finance, which has been investigating the effect of NRA on small companies, to consider its problems.

Meetings

FIRST national air-conditioning show will be held in Chicago starting the week of May 20, in conjunction with the annual convention of the National Society of Air Conditioning Engineers. The exposition will include a display of large and small air-conditioning units, equipment and accessories. J. C. Hines, air-conditioning engineer of the R. B. Hayward Co., Chicago, is head of the committee in charge of the exposition, which will be held at the Merchandise Mart.

Pungent Points by Weir Map Business Path

Business leaders of this country will have to fight if they expect to preserve American business from complete enervation.

I have always been in favor of the highest wages it is economically possible to pay. I believe that provisions for old age, for unemployment and for other security measures are humane and necessary steps that undoubtedly will be taken.

There is nothing more ridiculous than the statement that business men do not want to go ahead with the projects that will mean the re-employment of men, materials and money.

Government can give nothing of itself. Whatever it has must come from its people. Therefore it is an impossibility for government to support the people.

The huge spending program and all the preaching of demagogues and theorists cannot ruin the business of this country if business men will now stand up and fight for what they believe is for the best interests of the country.

The public, hearing nothing from business, naturally concludes that much of what is said against it is true.

** * *these actions of government harm not business men but business and therefore hamstring the activities by which the whole people earns its living.*

Industry Must Fight, Says Weir; Broadcast Truth to Public, Politicians

SOUNDING a tocsin to arouse American business to dangers now confronting it, Ernest T. Weir, chairman of the board of the National Steel Corp., Pittsburgh, told an audience of business men at the Union League club, Chicago, April 3, that the threat can be met and the danger vanquished by business asserting itself and abandoning the attitude of lying back and hoping for the best.

After referring to the attitude of the administration and its advisers that business and businessmen are at fault in the present situation and any suggestions for betterment from that source are tory and reactionary, he decried the silence for the most part maintained by business leaders. He declared:

Return to Common Sense

"Business leaders of this country will have to fight if they expect to preserve American business from complete enervation. I believe it is the urgent duty of those of us whose viewpoint is opposed to the underlying philosophy of the new deal to point out fearlessly, candidly, and vigorously the danger to the American people of any radical or hasty departure from what we have come to regard as the American scheme of things.

"You may rest assured that such expressions will be met with the familiar epithets of tory and obstructionist. But despite fads and brief periods of hysteria, a wholesome fund of common sense and fairness is characteristic of the American people. In the long run they are not likely to barter birthrights, hard won and long defended, for a mess of new dispensation pottage."

Commenting on pending matters seeking to change existing business conditions, Mr. Weir paid his respects to proposed legislation:

"As an example of a measure that would work great harm to industry, consider the 30-hour week bill. This is not supported by the administration, but it has many advocates in congress, and it has been urged consistently by the American Federation of Labor. Yet, a thorough study of this proposal by the Brookings institution proves that a 30-hour week would not support a standard of living as high as that of 1929, which certainly was none too high.

Ernest T. Weir

"Then, in another direction, you have the bill introduced by Senator Bankhead of Alabama as a direct attack on the basing point system in the steel industry. Here you have a case of a senator taking action, apparently with no knowledge whatsoever of the subject that he is attempting to regulate by law. Criticisms by his own constituents from Birmingham forced the good senator to announce that before pressing his bill he would 'give more study to its potential effect upon Alabama industries.'

"The steel industry has been one of the most competitive in the country. Throughout its history it has been a case of every unit fighting as hard as it could for business—as I can well testify. Despite this condition, the basing point system has been accepted by all of these units and has endured for many years. The only conclusion to be drawn is that the system is economically sound.

"The Wagner labor relations bill is one of the most vicious pieces of legislation ever proposed. It seeks to write into the law a principle of eternal warfare between employer and employe. The real purpose of the bill is to outlaw all plans of employe representation which do not function in connection with the American Federation of Labor.

"Organizations of the employes of a particular employer, sometimes called 'company unions', are assailed as 'company dominated unions', in utter disregard of the facts. Industry never could operate successfully under such law.

Puts Emphasis on Recovery

"We may be hopeful of the future, but you and I must live in the present. What the future will be, how quickly we get to a better footing, depends entirely upon what you and I and a lot of other people do now. Our most important duty must be to hasten recovery. We must do our best in our own business, making it yield as much as possible under the circumstances in wages and employment, to the stockholder and to the consumer. Beyond this, it is impossible to go, unless and until government shifts its eyes from reform to recovery.

"It is the responsibility of every business man to be articulate. The people down in Washington are doing the things they do and saying the things they say because they think that's what most of the people want. Unless they hear differently, the politician-mind will dictate that they go on thinking that. It is up to you as business men to take the lead in changing that mind.

"We have every right, as citizens, to voice our protest. Not only that, our positions in business give us the opportunity to see the effect of these things more clearly than the average person, and this fact alone charges us with the duty to show to the country that these actions of government harm not business men, but business, and therefore, hamstring the activities through which the whole people earns its living."

Production

STEELMAKING eased another point last week to 44 per cent, lowest point since the first week of January, and comparing with 48 per cent in the same week last year. In the major districts, Pittsburgh and Youngstown tapered off rather sharply, offsetting gains in the Chicago and eastern Pennsylvania areas. Details follow:

Youngstown—Sagged 2 points to 50 per cent, but is expected to reach 52 per cent at this week's start.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended April 6	Change	Same week 1934	Same week 1933
Pittsburgh	34	— 4	36	14
Chicago	50	+ 4	48½	15
Eastern Pa....	28½	+ 1½	35	11½
Youngstown...	50	— 2	55	17
Wheeling	76	—19	62	†
Cleveland	69	+ 2	67	33
Buffalo	32	— 3	50	14
Birmingham..	55½	None	52	12½
New England	52	+ 2	82	†
Detroit	88	None	88	†
	44	— 1	48	17½

†Not reported in 1933.

Forty-one of 83 open hearths are melting, and finishing operations are showing a greater gain than ingot output.

Chicago—Rose 4 points to 50 per cent. Despite the quieter situation in demand, fairly steady production is anticipated for April. Fourteen out of 36 steelworks blast furnaces are active, with two merchant stacks also in blast.

Pittsburgh—Off 4 points to 34 per cent. Some stocking of ingots by producers had been sustaining the operating rate, but in at least one case, this policy has temporarily ceased. The major share of steelmaking operations continues to move to tin plate and sheet producing mills.

Two steelworks blast furnaces have been dropped, leaving 20 out of 60 in operation. Carnegie has blown out one Carrie furnace, and Bethlehem has blown out a Cambria blast furnace at Johnstown, Pa.

Wheeling—Down 19 points to 76 per cent, one producer dropping one of its large units and another interest taking off six open hearths, leaving a total of 28 out of 39 active.

Buffalo—Eased 3 points to 32 per cent, with 12 out of 38 open hearths in production.

New England—Up 2 points to 53 per cent, one steelworks operating at 75 per cent. Tentative schedules for this week indicate slight, if any change.

Central Eastern Seaboard—Increased 1½ points to 29½ per cent, with the trend slightly upward this week. Of the various finishing operations, tin plate appears to be the best sustained.

Cleveland-Lorain—Up 2 points to 69 per cent, Corrigan, McKinney operating 13 open hearths, Otis 7, and National Tube, Lorain, 7. The rate probably will be down 2 points this week, as Corrigan, McKinney has only 12 units scheduled.

Financial

STEEL industry incurred a loss of over $25,000,000 last year, making the total deficit of the past four years $285,000,000, or more than $3 on each ton of ingots produced, according to the American Iron and Steel institute.

Last year's loss compares with $77,000,000 in 1933, $166,000,000 in 1932 and $17,000,000 in 1931.

In 1934 the industry paid $457,843,000 in wages and salaries and only $16,000,000 in dividends. Salaries and wages paid last year are the equivalent of $18 per ton of ingots produced; dividends equal 60 cents per ton.

The annual losses cited by the Institute are considerably higher than those disclosed by STEEL'S annual analysis of the industry, which is the most exhaustive available. STEEL'S analysis for 1934 will be published in about two weeks.

ARMCO CLEARS PREFERRED

American Rolling Mill Co., Middletown, O., has declared a dividend of $9.50 on its 6 per cent preferred, payable April 15 to record of April 5, cleaning up the accumulated arrearage on this stock. This announcement followed disclosure that the company's net income in 1934, after charges, was $966,566, compared with a net loss of $673,089 in 1933.

Transportation

CARNEGIE STEEL CO. sent out a tow of steel products from its Pittsburgh plants on March 30, loaded with approximately 12,000 tons of steel. It is reported that this is one of the largest single tows shipped out of Pittsburgh in the past five years. Delivery is for points along the Ohio and Mississippi rivers and as far south as New Orleans.

March Ingot Rate Lower; Exceeds 1934

STEEL ingots in March were produced at the average daily rate of 108,873 gross tons, compared with 114,255 gross tons in February, according to the compilation of the American Iron and Steel institute. The percentage of capacity engaged was 49.18 in March, compared with 51.61 in February. Total production in March was 2,830,700 gross tons, compared with 2,742,125 gross tons.

For first quarter total production was 8,406,995 gross tons, compared with 6,915,785 tons in the corresponding period of 1934. Average per cent of capacity engaged during first quarter this year was 49.32, in the same period of 1934, 40.27.

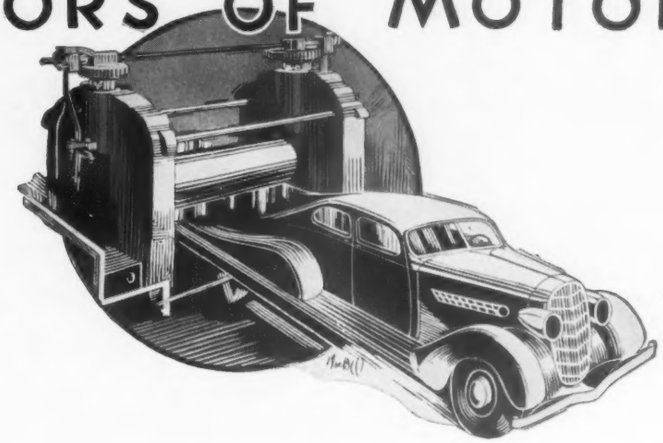
Monthly Production—Complete for Bessemer; Open Hearth, 99.32 per cent Calculated from Reports of Companies Making

	Open Hearth Gross tons	Open Hearth Per cent of capacity	Bessemer Gross tons	Bessemer Per cent of capacity	Total Gross tons	Total Per cent of capacity	Calculated daily production, all companies (gross tons)	Number of working days
1935								
Jan.	2,594,312	49.02	239,858	34.99	2,834,170	47.42	104,969	27
Feb.	2,517,789	53.53	224,336	36.82	2,742,125	51.61	114,255	24
Mar.	2,599,890	51.02	230,810	34.97	2,830,700	49.18	108,873	26
3 mo.....	7,711,991	51.10	695,004	35.56	8,406,995	49.32	109,182	27
1934								
Jan.	1,798,698	34.20	172,489	25.17	1,971,187	33.16	73,007	27
Feb.	2,007,287	42.93	175,873	28.87	2,183,160	41.31	90,965	24
Mar.	2,557,534	48.63	203,904	29.75	2,761,438	46.45	102,275	27
3 mo.....	6,363,519	41.88	552,266	27.89	6,915,785	40.27	88,664	78
Apr.	2,640,326	54.22	257,482	40.57	2,897,808	52.64	115,912	25
May	3,021,168	57.44	331,620	48.38	3,352,788	56.40	124,177	27
June	2,733,571	53.97	282,592	42.81	3,016,163	52.68	116,006	26
July	1,352,932	27.73	119,869	18.89	1,472,801	26.76	58,912	25
Aug.	1,253,972	23.84	109,598	15.99	1,363,570	22.94	50,503	27
Sept.	1,134,127	23.29	117,580	18.53	1,251,707	22.74	50,068	25
Oct.	1,334,298	25.37	127,789	18.64	1,462,087	24.59	54,151	27
Nov.	1,457,206	28.77	132,059	20.01	1,589,265	27.76	61,126	26
Dec.	1,810,139	37.17	131,456	20.71	1,941,595	35.27	77,664	25
Total.....	23,101,258	38.13	2,162,311	27.39	25,263,569	36.89	81,233	311

Capacity percentages for 1935 are based upon open-hearth capacity of 60,954,717 tons and bessemer of 7,895,000 tons on Dec. 31, 1934; for 1934 based on open-hearth capacity of 60,583,813 tons and bessemer of 7,895,000 tons on Dec. 31, 1933

*Revised.

MIRRORS OF MOTORDOM



DETROIT

HAVING completed the first million-car quarter since 1930 and lifted weekly assemblies to the level of the autumn of 1929, why shouldn't the automobile industry exude a sort of reckless optimism and display a bit of disdain for those industries still struggling in the backwash of the depression?

But only for a moment does the industry thus indulge itself. Excellent as the first quarter was, it is now history, and beyond supplying a passing gloat it only affords a yardstick for measuring the effort of the second quarter. And at this distance, it looks as if the second quarter would be not much short of the first.

In round numbers, January output of passenger cars and trucks in the United states was 293,000, February 340,000, and March upward of 410,000—a total of about 1,050,000 for the quarter.

April has the same number of working days as March, and since the month has opened considerably stronger than March did, the prospect of a 450,000-car month is bright. May and June can be expected to develop moderate, progressive slides from this level.

15 PER CENT BETTER YEAR?

In view of the many uncertainties besetting business, it is almost foolhardy at this time to forecast a second quarter total, but 900,000 might be a good guess. Since the first half normally accounts for 60 per cent of the year, this foreshadows a 1935 total of about 3,170,000 units, or 15 per cent more than in 1934.

Notwithstanding the high output of the first quarter, factory and retail sales stocks of new cars are not abnormal. A few manufacturers have outrun retail sales, for one reason to guard against potential labor troubles. In relation to production, stocks of Chrysler lines probably are the largest.

But Ford has not yet caught up with demand for two-door jobs; Chevrolet has not yet reached its maximum on the master series; both Olds and Pontiac still cannot make prompt deliveries on certain colors.

It needs also to be considered that in the first few warm, bright days of spring the urge for new cars, like bulbs, pushes up at a prodigious speed, and some stocks to satisfy this bulge are normal.

Who has been buying the new cars to date? More than has been generally realized, steel labor has had a good first quarter; rubber workers have been active building up a five-month supply of tires; in some districts, notably Detroit, all railroad labor has been recalled; railroad employes generally have received good wages, despite the financial plight of the carriers; AAA payments in the Middle West and parts of the South have been large.

Not all of the buying momentum generated by first quarter activity has been spent, Detroit believes. Beginning April 1, for one thing, all railroad labor went back to pre-depression hourly rates with a consequent expansion of purchasing power. While far from normal, more seasonable weather in the North will shortly stimulate outdoor construction.

The long-pull view of the automobile industry is this: Steel and some other industries are in a slide that probably will not be arrested until July or August, but after the turn of midsummer business generally will embark on the longest sustained period of improvement since the depression set in, probably holding until the second quarter of 1936. To this the five billion dollar work relief program just voted by congress will contribute considerably, it is thought.

STILL MORTGAGING FUTURE

There still is nothing in the experience of the average man to compare with "wearing the new" off an automobile, and the average buyer needs only the prospect of continued employment rather than an accumulation of capital to sign his name on the dotted line.

The automobile industry is not talking much about this, because it is too astute to wear its hopes on its sleeve, but it expects NRA to fall to pieces the middle of June, followed by a brief period of cutthroat price competition among its suppliers—this hectic period probably to be the final shakeout of industry and to restore normal competition as a precedent to the nine or ten-month upswing previously mentioned.

The chief obscurity now of the last half year is the prospective revolution in presenting new models. In extending the automobile code the understanding was that 1936 models would be introduced 60 days on either side of Oct. 1. The new car band thus extends from Aug. 1 to

How Top 15 Auto Makers Rank in Sales and Value

	Units sold in 1934	Average price at factory	Total dollar value	Rank in 1934 Sales	Rank in 1934 Value
Chevrolet	534,902	$580	$310,243,160	1	1
Ford	530,531	535	283,834,085	2	2
Plymouth	302,557	560	169,431,920	3	3
Dodge	90,183	700	63,128,100	4	4
Pontiac	72,645	745	54,120,525	5	7
Oldsmobile	71,673	850	60,922,050	6	6
Buick	63,069	1000	63,069,000	7	5
Studebaker	41,560	825	34,287,000	8	8
Terraplane	40,527	615	24,924.105	9	10
Chrysler	28,052	1000	28,052,000	10	9
Hudson	19,307	745	14,383,715	11	11
Nash	14,316	875	12,526,500	12	12
Graham	12,888	925	11,921,400	13	13
De Soto	11,448	995	11,390,760	14	14
Lafayette	9,303	645	6,000,435	15	15

Where a manufacturer makes only one series the price of the two-door sedan is used as the average. Where there is more than one series, the average is an estimate. Sales figures are from *Cram's Reports.*

Nov. 30. There is now some talk of holding the New York show in the first week of November.

Not being signatory to the code, Ford continues a lone wolf. Buick, not having changed most of its series for 1935, is expected to be out with its 1936 series about Aug. 1. Cadillac, in the same position, will probably parallel Buick.

If automobile sales managers come up to July with demand for the 1935 models still strong, they will throw their influence behind a movement to postpone showing new jobs as late as possible. Necessarily, Chevrolet and Plymouth will be largely governed by what the indications are Ford will do.

There is considerable doubt in Detroit whether even Mr. Roosevelt and his new deal can change the automobile buying habit of the nation. January shows and early spring deliveries date back to the era of open cars, but even in this age of closed cars the habit persists.

A November show would coincide with the advent of bad driving weather in the northern states, and the first payment would be due just about Christmas shopping time. Hence sales managers are not particularly keen about the proposed change, and if NRA collapses (the wish is father to the thought in Detroit) the proposed reform may not eventuate.

BAR MARKET COLLAPSES

Having restricted its own code to maximum hours and minimum wage rates and carefully avoided any semblance of price control, the automobile industry is disdainful of other codes. Last week it witnessed, with no regrets, the collapse of the cold-finished steel bar market.

A quarter ago cold bar finishers were able to ignore a $3 a ton reduction filed by a small maker in Detroit whose production for the open market is negligible. But when a second cold bar finisher in Detroit, of slightly larger capacity than the first, met this reduction last week for the second quarter, the whole industry followed.

The significant thing to automotive buyers is that the differential of cold finished bars over carbon bars is now reduced from $6 a ton to $3. They are hoping that the cold finishers join them with pressure on the carbon bar market, and if carbon bars caved in the entire steel price structure would fall. Automotive buyers, of course, are perennial bears on prices, and here again the wish is father to the thought.

THE current trend toward broad, sweeping fenders and bodies has put some of the large presses in body shops to a real test. Dies are larger and the overhang of dies on some presses is as much as 18 to 24 inches. It is not unheard of to have these dies snap off due to the tremendous pressure involved in forming the deep drawn sections, there being no support for the overhanging sections of dies.

This situation is made to order for press builders, who have been quick to sense the problem and design new presses with larger bed areas to accommodate the huge dies. One body shop in Detroit now is installing a 450-ton press of all-welded steel plate construction, with four-point suspension.

Distance between uprights is 125 inches, and from front to back 80 inches. Overall height is approximately 35 feet; and about 14 feet of this height is below floor level. Currently it is to be used for flanging quarter panels, but its size will make it a busy unit in handling future large-size stampings.

PRESS ENGINEERS BUSY

Body engineers these days are accomplishing some noteworthy feats in the interest of speeding up production and lowering costs. For instance, on one particular large body stamping job, production was 10 pieces per minute on a trimming press. A change in schedules meant that production had to be stepped up to 18 pieces per minute. Calculations showed that by taking off the old press motor and replacing it with one of higher horsepower, changing pulley sizes and putting two more men on the press crew the required speed could be met.

Another example involved a saving in material costs. Instead of taking a full-size rectangular blank for a certain body stamping, a small sheet is flash welded to one corner of a larger sheet, and after trimming off the flash and rolling the seam a blank is obtained which follows the outline of the finished stamping with only a small scrap loss. After finishing up the stamping by grinding and sanding, the seam cannot be detected.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	340,544
Mar.	115,272	331,263	410,000*
3 mo.	349,544	719,877	1,043,309
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,871	.....
Oct.	134,683	132,491	.....
Nov.	60,683	78,465	.....
Dec.	80,565	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*
Week ended:

Mar. 23	100,065
Mar. 30	103,286
Apr. 6	107,895

WHEN last week's assemblies, as compiled by Cram's Reports, reached 107,895, they swept aside every weekly statistic since the last week of August, 1929.

Ford last week made 6425 units a day on a 6-day week basis. Total General Motors production was 38,-25, an increase of 3000, and Chrysler 19,725, a decline of 225.

Ford's March output at 158,887 units was more than double the 77,-947 in March, 1934. While Ford has announced an April objective of about 152,000 units, the trade understands this has been reduced to 135,-000. Chevrolet, trying to make up for a late start on its master series, has scheduled 132,000 for April and 134,000 for May.

Hupp, one of the fine old makers, is giving its friends bad moments as the several-year fight between the management in Detroit and retail representatives, principally in the East, was dragged into the open. The formation of a dealers' organization and a bloodless purge of employes in Detroit, to sift out disloyal ones, marked last week.

Hupp meanwhile, has applied for a $2,000,000 government loan to tide it over a rough spot. Hudson recently sought a government loan but was turned back to the banks, where its credit still is good but the interest rate is higher.

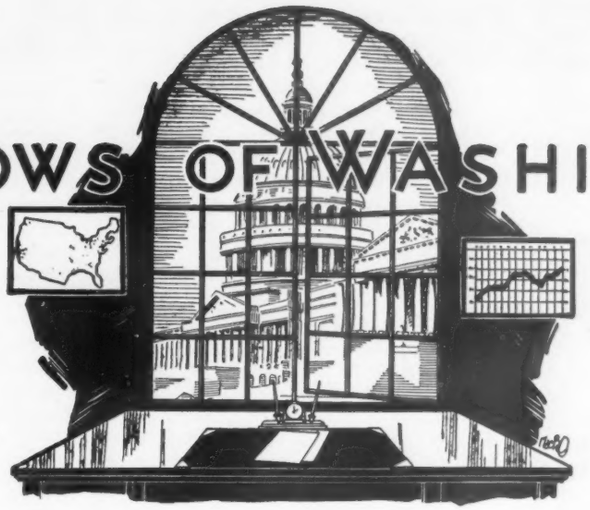
Foreign Trade

JAPAN'S purchases of tin plate scrap constitute a serious drain on the raw material for the domestic detinning industry, W. J. Buttfield, president, Vulcan Detinning Co., Sewaren, N. J., warns in his annual report. Average wages of Japanese detinning companies are said to be 10 per cent those of the United States. Tokyo newspapers report detinners pressed to meet big demand for war supplies. Some regulation of exports is urged.

CLAIM 528-HEAT RECORD

Soviet metallurgical authorities claim a record for the No. 1 open-hearth furnace at the Tagil works, which late in January had been tapped for 528 heats. It is shortly to be relined, according to the chamber of commerce of the U. S. S. R.

WINDOWS OF WASHINGTON



WASHINGTON

HEARINGS on the NRA investigation before the senate finance committee are dragging along wearily. Four weeks of the hearings have now been held—and the end is not yet.

The hearings are having a bad effect at NRA headquarters as well as on members of the committee. It seems that all of the employes of the Blue Eagle are attending the hearings. Even the office boys are taking some of their annual leave to attend them.

It is seriously getting to a point now that when you want to see any NRA officials you go to the hearing and catch them there, thereby saving a lot of time warming the chairs at headquarters.

It is considered doubtful if the senate is getting any place and there has been talk in some high government quarters that Senator King of Utah, outspoken opponent of NRA, and some of those believing as he does, are deliberately trying to continue the hearings on forever in a sort of committee filibuster.

After all, it is only a couple of months before the NRA act expires and if the committee runs on much longer Senator King and his crowd won't have such a hard time filibustering NRA out of existence.

It will take some time to get this act through the senate, and of course there is no question but what the house will want to hold protracted hearings; for no matter how long either branch of the congress holds hearings, the other branch feels it must do the same.

Therefore, if the administration really means business on the NRA it will have to hurry.

FORMER LINK-BELT, WALWORTH MAN ADMINISTERS

While no major changes have been made in NRA since the advent a few weeks ago of Donald Richberg, a few changes are being made gradually.

Prentiss L. Coonley has been appointed code administrator, succeeding Don M. Nelson, while the latter will continue his duties as assistant to the chairman of the recovery board.

Incidentally, Mr. Nelson has not changed his mind about leaving Washington, and he will go back to Sears, Roebuck & Co., Chicago, either the middle of this month or certainly by the first of May. The administration very much wishes that it could keep him here because he has both feet on the ground and has been invaluable to the industry of the country in his key position—whether industry knows it or not.

Mr. Coonley was connected with the Link-Belt Co. until 1925, when he became first vice president of the Walworth Co., New York. He has been acting division administrator since August.

No one has yet been appointed to succeed Arthur D. Whiteside as member of the national industrial recovery board, and now that the appointment has been held up this long there is talk here that it may not be made until after the President returns from his fishing trip later this week. Names mentioned in these columns last week are still being discussed as possible Whiteside successors.

NRA SEES POULTRY VERDICT OFFSET FOR BELCHER DEBACLE

In view of the withdrawal from the United States Supreme Court of the Belcher case, which he said was done against his recommendation, Mr. Richberg at his press conference Thursday made much of the decision handed down in New York last week by the United States circuit court of appeals for the second circuit in the case of the United States against A. L. A. Schechter Poultry Corp. and which he stated upheld the constitutionality of the NRA act in all it phases.

"The opinion and decision of this court," he said, "in which the court unanimously sustained the constitutionality of the NIRA is the most important judicial opinion rendered on NRA. The defendants were convicted by a jury of conspiracy, of violating the NIRA and the code of fair competition for the live poultry industry.

"The court of appeals sustained the convictions except violations of minimum wages and maximum hours, which were not sustained by two of the judges for reasons expressly confined to this particular case."

Mr. Richberg stated that the department of justice will expedite this case to the Supreme Court in an effort to get a decision before the court adjourns for the summer. Even at that it is hard to see how such a decision could be rendered before congress has enacted a new NRA law, if any is to be enacted.

Mr. Richberg is much upset by what he terms the unfair attitude of the press on the NRA court cases. He stated that favorable decisions have been rendered by courts to NRA in 186 cases and that only 20 have been unfavorable up to this time. Carrying this along further, he stated that 42 district courts have handed down favorable decisions by 65 judges while there have only been 15 unfavorable decisions handed down by the same class of courts by 16 judges.

BASING POINT ISSUE UP TO PRESIDENT—AND HE FISHES

The steel basing point question is as quiet as the grave. There has been no mention of it here since the reports were made public some weeks ago.

The national industrial recovery board, it would seem, feels as though the issue is now up to the President for action. At least, this is the only way to interpret its action in setting aside the bolt and nut code because it has basing point provisions similar to the steel code.

Officials of NRA feel generally that nothing will be done about the basing point situation at this time. It is ex-

pected, of course, that this will have to be taken into consideration when and if the steel code is either amended or extended, depending on just what eventually happens to the stalled NRA.

MAY MAKE STEEL CODE ASSESSMENTS MANDATORY

Nothing has been made public officially at NRA, but it is understood that the steel code authority—the American Iron and Steel institute—has submitted a proposed budget for the first six months of this year beginning Jan. 1, which has been tentatively approved at NRA.

The code budget for 1934 was approximately $500,000, and it is said that the budget for 1935 is about the same.

Up to this time, code assessments in the steel industry have been purely voluntary, but there are some officials at NRA who believe that the code authority will ask to have the assessments mandatory with the approval of NRA.

At present, more than 90 per cent in dollars and cents of assessments for various code authorities is on a basis of mandatory assessments, it is stated at NRA.

CLAIM 21,000,000 MAN-HOURS IN PWA RAIL LOANS

The bureau of labor statistics reports that production of steel rails purchased by the railroads with PWA loans in 1934 provided 21,000,000 man-hours of indirect and industrial employment in all branches of the steel industry.

PWA loans to 19 railroads for rail purchases resulted in the manufacture of 424,744 tons in 1934, or 16,500 tons more than the total rail production of the steel industry in 1933. A total of 1,007,746 tons of rails was rolled last year, according to trade records.

Purchases financed by PWA account for 42 per cent of the total rail production for last year, indicating the extent to which the public works program has helped the heavy industries.

PWA states that the rail purchases account for only a small part of the total volume of indirect and industrial employment created in the steel industry by its program. Large amounts of structural steel, pipe and other products of the steel mill are consumed in the PWA program.

WAGNER BILL OPPONENTS MAKE FIGHTING FINISH

Several weeks of hearings by the senate committee on education and labor on the Wagner labor disputes bill were concluded last week.

At the beginning, proponents of the bill swarmed over the capitol but latterly opponents appeared in large numbers and seemingly had the better of the argument.

One of the curious things about this bill is the attitude of the administration toward it. The President "won't say yes and he won't say no," but the general feeling is that he does not favor the bill and he made no mention of it in his "must" legislation recently.

James A. Emery, general counsel of the National Association of Manufacturers, which has been so opposed to the Wagner bill, was the last witness to be heard.

He said that (speaking of the Wagner bill) "analysis and experience demonstrates it to be bad law and worse policy. Under the pretense of regulating commerce, it seizes control of production on the thin theory that every labor dispute within a factory or store imperils the commerce of the nation."

Speaking of the new labor board proposed in the bill, Mr. Emery said that "detective, prosecutor and judge, this poobah of federal authority would crown its glories with the title of election judge."

JURISDICTION OF STEEL FOUNDRY CODE VEXES

Appearing on behalf of the steel casting industry, F. A. Lorenz Jr., Chicago, chairman of the code's administrative agency, last week submitted this interpretation of the scope of the industry:

"Steel castings (whether finished, semi-finished, or rough), when sold for use as repair or replacement parts for products of another industry already in use and sold in the open market in competition with similar castings produced by other members of the steel casting industry, are subject to the code of fair competition for the steel casting industry, regardless of whether or not they are produced and/or sold by a company which is owned by or affiliated with another company producing and/or selling new products of another industry."

Explaining that the administrative agency had given further consideration to the matter since the notice of hearing was published, Mr. Lorenz pointed out that it now considers such an interpretation "entirely too broad." Accordingly, he added, it is now suggested that it be revised to specifically exclude (1) members of another industry that do not own or are not affiliated with a steel foundry; (2) the repairing, replacement or maintenance of castings for use by the companies producing them, or by their affiliates, in construction, replacement or maintenance of their own plant facilities; (3) members of another industry if the members thereof collectively can establish that during the immediately preceding two calendar years, the preponderance of the tonnage of repair or replacement parts for the products of that industry already in use by customers which do not own or are not affiliated with a steel foundry was produced and sold by the members of that industry; and (4) patented articles.

Although conceding that this interpretation is "quite different" from the earlier draft, Noah Stancliffe, counsel for the locomotive manufacturing subdivision of the machinery and allied products industry, vigorously objected to it.

Oppose Civil War in Steel Industry

Representatives of steelworks labor in the corridor of the senate office building at Washington following their appearance before the senate labor committee in opposition to the Wagner labor disputes bill. The bill, they contended, would drive a wedge between employers and employes rather than enhance labor's position. Second from the left is Jack Larkin, chairman of the Weirton Steel Co.'s employe representation plan

Industrial Men in the Day's News

ALBERT C. LEHMAN, president of Blaw-Knox Co., Pittsburgh, has been elected to the newly created post of chairman of the board.

Irvin F. Lehman, vice president, has been elected president of the company, and Frank Cordes has been named senior vice president.

The following have been re-elected: Chester H. Lehman and Robert F. McCloskey, vice presidents; George L. Dumbauld, treasurer; H. B. Loxterman, secretary; B. L. Hirshfield, chairman of the finance committee; Paul W. Keim, assistant treasurer; H. S. Strassburger, assistant treasurer and assistant secretary, and P. A. McCullough, comptroller.

♦ ♦ ♦

John R. Poyser has returned as sales manager of Doelger & Kirsten Inc., Milwaukee, manufacturer of alligator shears. Formerly he had been associated with this company in a similar capacity for ten years.

♦ ♦ ♦

Walter E. Barnes has been appointed assistant to F. H. Gordon, vice president in charge of sales at Lukens Steel Co., Coatesville, Pa. Mr. Barnes joined the Lukens organization in 1910. He spent six years in the mills and in 1916 was transferred to the order department, in 1927 to the sales department. Subsequently, he was appointed manager of claims and then assistant to general manager of sales, in which capacity he served until his recent appointment.

Walter E. Barnes

♦ ♦ ♦

Roy E. Adams, William R. Adams, Howard R. Meeker, Frederick E. Matson, John E. Kendall, Floyd D. Wallace and William W. White have been elected to the board of directors of the J. D. Adams Mfg. Co., Indianapolis, manufacturer of welders and machinery for road building and maintenance.

♦ ♦ ♦

Harry F. Boe, manager of the Buffalo branch of the Westinghouse Electric & Mfg. since 1926, has been transferred to similar duties in the company's eastern division headquarters in New York.

♦ ♦ ♦

B. F. Downey, since 1914 secretary and treasurer of the Yost Superior Co. and its predecessors, the Yost Gearless Motor Co. and Superior Spring Co., Springfield, O., and active with these interests for 27 years, was host at a dinner April 6 for plant and office employes in celebration of his twenty-seventh business anniversary. The company specializes in coiled wire springs and wire specialties.

♦ ♦ ♦

Prof. Elihu Thomson, one of the founders of the General Electric Co., was honored on his eighty-second birthday, March 29, by being presented with the medal of honor of the Verein Deutscher Ingenieure, Germany. Presentation was made in

Dr. Paul D. Merica, New Vice President, American Institute of Mining and Metallurgical Engineers

After college education in this country, he became professor of chemistry at a Chinese university.

Later he went to Germany for his Ph. D. degree, returning to join the staff of the bureau of standards.

A prolific writer on matters technical, he is a recognized authority on alloys of nickel and copper.

DR. PAUL DYER MERICA, recently (STEEL, Feb. 25) elected vice president of the American Institute of Mining and Metallurgical Engineers, is a recognized authority on nickel, copper and other alloys. He is assistant to the president, International Nickel Co., New York.

The son of a clergyman and educator, who for several years was president of the University of Wyoming, Dr. Merica was born in Warsaw, Ind. He attended De Pauw university and the University of Wisconsin, subsequently journeying to China where he was professor of chemistry in Chekiang Provincial college, Hangchow, until 1911.

Dr. Merica then went to Germany to study and received his Ph.D. degree from the University of Berlin, early in 1914, whereupon he returned to America as special investigator at the engineering experiment station at the University of Illinois. However, a few months later he joined the staff of the national bureau of standards as associate physicist, and remained with that organization as physicist and metallurgist until 1919.

Since then he has been associated with International Nickel, first at Bayonne, N. J., as physical metallurgist and later as superintendent of research, director of research, assistant manager of development in research and assistant to the president.

He has written or collaborated in numerous important papers on metallurgical subjects and has contributed widely to papers presented before various technical organizations. In February, 1929, he was awarded the James Douglas medal of the American Institute of Mining and Metallurgical Engineers.

Boston at a luncheon meeting of the General Electric board of directors. E. W. Rice Jr., former president and now chairman of the board of directors, received the award in absence of Prof. Thomson, whose health did not permit him to leave his home in Swampscott, Mass.

♦ ♦ ♦

Harry Ewert has been appointed assistant sales manager of the welder division of Harnischfeger Corp., Milwaukee. For the past ten years he has been identified with production and sales of welding machines for the company, being closely associated with the inventor of the P&H Hansen welder, K. L. Hansen.

♦ ♦ ♦

William C. Moreland, vice president of Jones & Laughlin Steel Corp.,

William C. Moreland

Pittsburgh, celebrated his fiftieth anniversary with Jones & Laughlin on April 4. Among other testimonials, a watch was presented to Mr. Moreland.

He entered the employ of the Jones & Laughlin interests April 4, 1885, as a telegraph operator, and success-

(*Please turn to Page* 68)

Died:

W. H. HASSINGER, 73, retired industrialist and formerly vice president in charge of the Birmingham, Ala., district for the Republic Iron & Steel Co., in Birmingham, March 28. At one time he was also president of the Southern Steel & Iron Co., subsequently the Gulf States Steel Co. A member of a prominent New Orleans family, he went to Birmingham in 1887 and, with associates, built the Alabama Rolling Mill, later merged with Republic Iron & Steel.

♦ ♦ ♦

E. E. Green, contracting engineer in charge of the St. Louis office of American Bridge Co., in St. Louis, March 30.

♦ ♦ ♦

Frank R. Rhodes, 57, formerly a member of the firm of Eaton, Rhodes & Co., agents for pig iron and coke, in Cincinnati, March 28.

♦ ♦ ♦

Charles Clark, for many years purchasing agent of the former Pittsburgh Forge & Iron Co., Pittsburgh, in Crafton, Pa., March 27.

♦ ♦ ♦

Edmund J. May, 57, vice president of the Eagle Iron Works, Brooklyn, N. Y., in that city recently. He was the son of the founder of company, the late Jacob May.

♦ ♦ ♦

C. G. Johnson, president of the Overhead Door Corp., Hartford City, Ind., in Houston, Tex., recently. He was co-inventor of the overhead door built by the company he founded.

♦ ♦ ♦

William Merz, 68, formerly superintendent of the Hawthorne plant of the Western Electric Co., Chicago, in Miami, Fla., April 3. He retired six years ago, after 46 years' service with Western Electric.

♦ ♦ ♦

Frederick G. Jones, 62, for 15 years superintendent of Scott & Williams Foundry, West Concord, Mass., in that city, March 28. He was also associated with the M. D. Jones Iron Works, West Concord.

♦ ♦ ♦

Albert H. Homans, 55, vice president of the Fairmount Tool Co. and Continental Products Co., Cleveland, and president of the Gibson-Homans Co., Cleveland, in that city, April 1.

♦ ♦ ♦

Dr. F. Thomas Nason, 68, chairman of the executive committee of McKeesport Tin Plate Co., McKeesport, Pa., president of Columbia Radiator Co. and director of the Metal Package Co., in McKeesport, April 4.

♦ ♦ ♦

B. F. Moore, 80, vice president and treasurer of the Moore-Handley Hardware Co., Birmingham, Ala., in that city, March 26. The company is one of the leading wholesale hardware and mill supply houses in the south.

♦ ♦ ♦

Albert E. Convers, 77, chairman of the board of Dow Chemical Co., Midland, Mich., in Cleveland, April 3. Associated with the company since its inception in 1897, he was president at one time and was made chairman in 1918. He was a director of the Hillwood Mfg. Co., Cleveland.

♦ ♦ ♦

John Skogmark, 58, chief engineer, Chemical Appliances Inc., New York, and during the World war a co-designer of the munitions plant at Nitro, W. Va., in Brooklyn, N. Y., March 26. Born in Sweden, he was a member of various engineering societies.

♦ ♦ ♦

Dr. James A. Mullenbach, 65, formerly a member of the national steel labor relations board at Washington and nationally known labor arbitrator and educator, in Chicago, April 3. He was appointed to the board on its formation last July, resigning from this and the oil and textile labor boards in November on account of illness. For many years he was identified with labor, educational and charitable affairs in Chicago. He was appointed first member of the regional labor board for the Chicago

Charles A. Adams

Plant superintendent for the Mathews Conveyer Co., Ellwood City, Pa., whose death was noted in these columns of STEEL for April 1

district, later advancing to posts on the steel, oil and textile boards at Washington.

♦ ♦ ♦

Stanley S. Holmes, 54, vice president of the Western Electric Co. and manager of the company's plant at Kearny, N. J., in Maplewood, N. J., April 1. He became an apprentice in the Chicago shops of Western Electric in 1900 and moved up through the engineering inspection department, engineering experimental laboratories, detail design department, and New York experimental laboratories. In 1922 he was named general superintendent of installation at New York, and in 1923 assistant manager at Kearny. Four years later he became manager. He had been active in civic affairs over a long period of years, and at the time of his death was president of the Newark chamber of commerce.

EDITORIAL

Who Can Solve Problem of Seller-Customer Competition?

ONE wonders whether the industrial leaders of 1935 realize the extent to which many of the most serious problems of present-day competition are traceable to an incongruous relationship between buyers and sellers.

To illustrate: Company A sells a certain commodity to Company B. Company B may be a distributor or a processor of that commodity, but in any case it resells to another distributor or to the ultimate consumer. However, Company A also distributes or processes its own commodity, and thus competes directly with its customer, Company B. The dual role of Company A as seller and competitor introduces a series of difficult problems.

To appreciate the far-reaching import of these problems, consider the competitive warfare now raging in some of the leading industries. In the distribution of motor oil and gasoline, one of the principal difficulties arises from the fact that refiners, while selling to independent filling stations, also maintain their own stations and therefore compete with their customers for the trade of the motoring public.

Some automobile tire manufacturers sell to automobile accessory stores and garages, yet maintain their own stores and service stations, which vie with the tiremakers' customers for the public's tire dollar.

A number of producers of nonferrous metals—brass, copper, aluminum, etc.—are vendors to fabricators of these materials, yet the producers use part of their product for the manufacture of tubing, screws, bolts, nuts, wire shapes, etc., which they sell in direct competition with their own customers.

Seller-Customer Competition Is Established Practice in Many Important Industries

The list could be extended indefinitely, and would include practically every major industry. The point is that the practice seems to be firmly established throughout the American industrial structure. It is not a device peculiar to any one industry.

This fact should be considered in studying the problem as it applies to the iron, steel and metalworking industries. For many years the competition between integrated producers of steel and processors and fabricators of steel has been the source of unfortunate misunderstandings and considerable ill feeling.

The difficulty extends to many branches of the industry. It is a dominant factor in the merchandising of structural steel, tin plate, merchant bars, sheets, wire products, plates, etc. Even in secondary operations the problem is a perennial source of friction.

In view of the foregoing, it is clear that the action of an association of independent structural fabricators in placing their grievances in the hands of the federal trade commission is a symptom of a dangerous, widespread infection which permeates many industries. The scores of executives who have labored unremittingly for a dozen or more years to promote harmony between the mill interests and the independent fabricators undoubtedly deplore the fact that the situation had reached a point where the complainants felt that they had to submit their case to a government agency.

Failure To Agree Within Industry Exposes Problem to Fate of Political Football

No conscientious industrialist on either side of the controversy can escape the feeling of regret that the matter was not settled by intelligent co-operation within the councils of the industry. To put it up to the federal trade commission, or to call it to the attention of congressmen who are avowed enemies of NRA, is equivalent to offering it as a political football—to be kicked around by playboys who cannot possibly fathom the merits of the case.

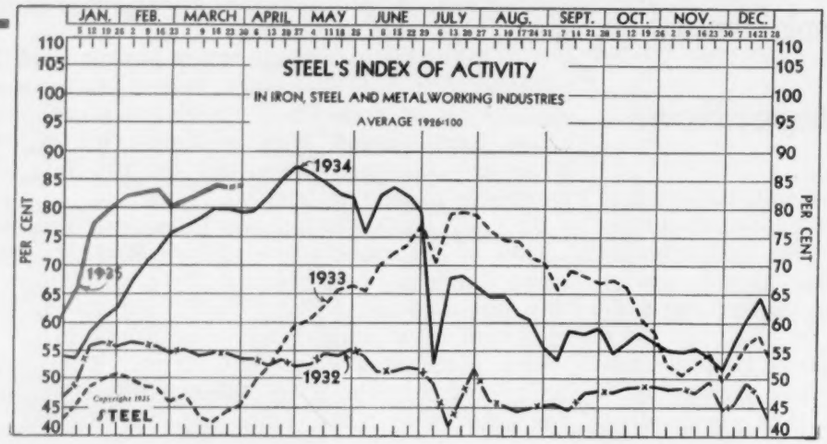
No impartial observer is able to state dogmatically that the whole blame can be laid at the doorstep of either party. The details of the fundamental issues have been thrashed out time and time again during the past 20 years. In every discussion, evidence of mistakes on both sides has been produced.

Possibly the unfortunate affair could have been averted if the structural steel fabricators had been successful in securing approval of the code which they submitted to the government in the early days of NRA. The industry has suffered severely from the shameful manner in which the government has mishandled its code application. It has been deprived of certain advantages which other branches of the steel industry have enjoyed. In this the government and not the fabricators must take the full responsibility.

We cite the difficulty in the structural fabricating industry as a lesson to other industries of the folly of temporizing with the seller-customer competitive problem.

Air your laundry in your own back yard!

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained 0.3 points to 84.3 in the week ending March 30:*

Week ending	1935	1934	1933	1932
Feb. 9	82.7	70|7	48.7	56.0
Feb. 16	82.8	72.4	48.3	54.4
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	43.4	54.8
Mar 16	84.0	79.9	42.7	54.4
Mar. 23	84.0†	79.7	44.6	53.5
Mar. 30	84.3*	79.3	45.2	53.4

†Revised *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Game Fight of Business Is Reviving Confidence

NOW that the hurdle of April 1 has been passed, the outlook for the second quarter appears to be appreciably brighter than it was a fortnight ago.

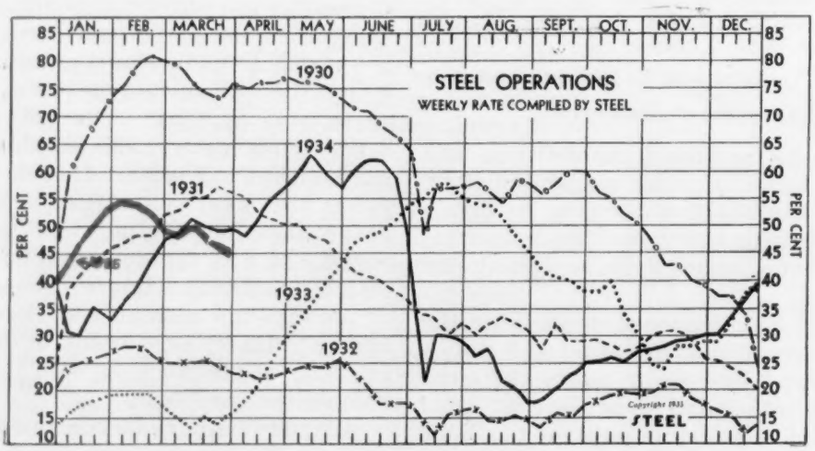
At that time business men were wondering whether the current activity in industry could withstand the demoralizing influence of bearish business sentiment. The hopeless aspect of the scene in Washington, the threat of strikes in coal, rubber and other industries, the tense political situation in Europe and other discouraging factors were darkening the horizon of business as effectively as the dust storms were shutting out the sunlight from the prairie states.

Meanwhile the ability of business to hold its own in this nip and tuck contest with gloom has brought fresh courage to everyone. Confidence again is mounting slowly.

Thanks to improved operations in four major districts, the steelmaking rate in the first week of April turned upward after declining since early in February. Automobile production continues at 1929 levels, but the peak probably is near at hand. Electric power output seems to be approaching stabilization at a point about 5 per cent above corresponding figures for last year. Revenue car loadings continue to gain. Freight traffic for the last week of March promises to be the heaviest since last fall.

STEEL'S index of activity for the week ending March 30 stands at 84.3. This is the highest point yet recorded in the cycle of recovery which started last December. The index now is only 3.2 points below the peak of 1934, which was 87.5 as of the week ending April 28.

1935 Per Cent	
Mar. 30	45
Mar. 23	46
Mar. 16	48
Mar. 9	50
Mar. 2	48
Feb. 23	50
Feb. 16	53
Feb. 9	54.5
Feb. 2	54.5
Jan. 26	53
Jan. 19	51
Jan. 12	45½
Jan. 5	42½

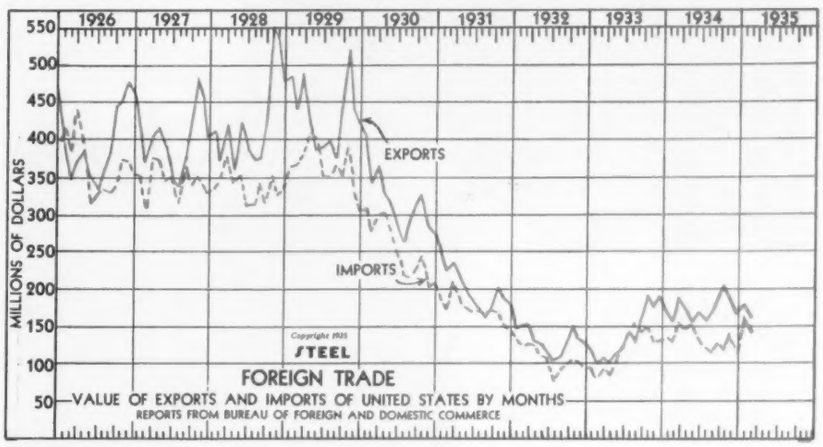


1934 Per Cent	
Mar. 31	49
Mar. 24	49
Mar. 17	50
Mar. 10	51
Mar. 3	48
Feb. 24	47
Feb. 17	43
Feb. 10	39
Feb. 3	36
Jan. 27	33
Jan. 20	35
Jan. 13	30
Jan. 6	31

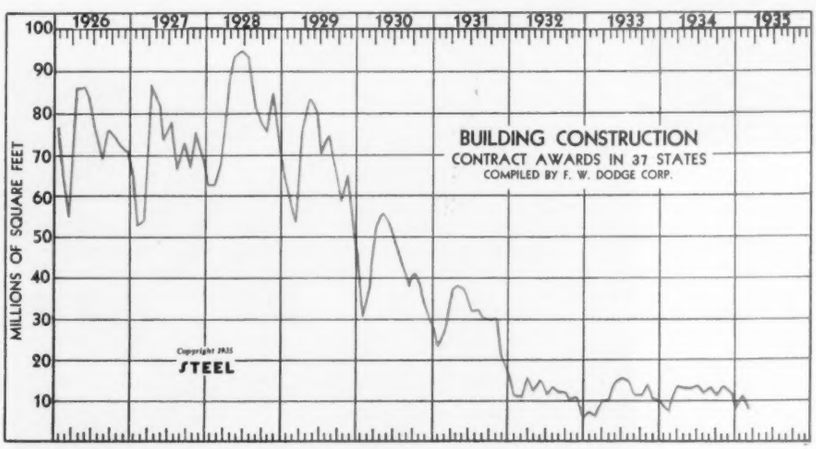
Merchandise Foreign Trade Down in February

Millions of Dollars

	1935		1934	
	Exports	Imports	Exports	Imports
Jan.	176,223	166,993	169,531	128,536
Feb.	163,006	152,537	159,671	125,292
March	.....	.....	190,000	158,000
April	.....	.....	176,499	141,137
May	.....	.....	160,207	154,647
June	.....	.....	167,957	135,048
July	.....	.....	161,787	127,342
Aug.	.....	.....	171,965	119,516
Sept.	.....	.....	191,690	131,659
Oct.	.....	.....	203,622	137,859
Nov.	.....	.....	194,909	150,919
Dec.	.....	.....	170,676	132,252



Building Trend Remains at 1934 Level



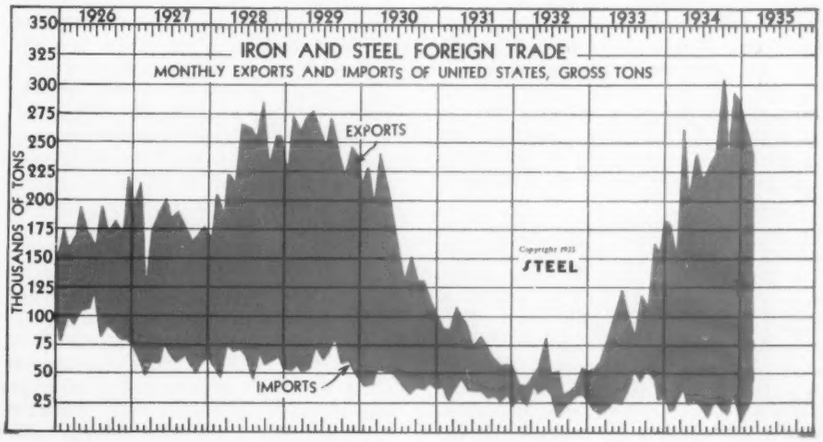
Square Feet

	1935	1934
January	11,245,100	9,568,700
February	9,670,300	8,176,300
March	.....	14,788,900
April	.....	14,207,100
May	.....	14,664,400
June	.....	13,986,500
July	.....	13,250,000
August	.....	14,259,000
September	.....	12,510,300
October	.....	15,098,100
November	.....	12,780,800
December	.....	9,193,300

February Steel Exports Shrink as Imports Rise

Gross Tons

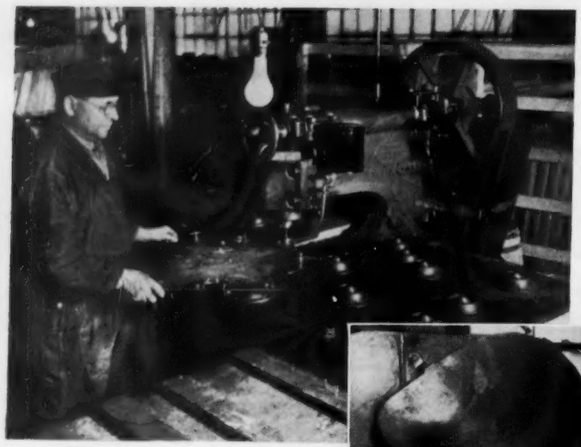
	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	.....	.....	38,393	261,269
April	.....	.....	26,862	201,539
May	.....	.....	29,465	241,753
June	.....	.....	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764



Unusual Fabricating

All-Steel

BY E. C. KREUTZBERG
Engineering Editor, STEEL



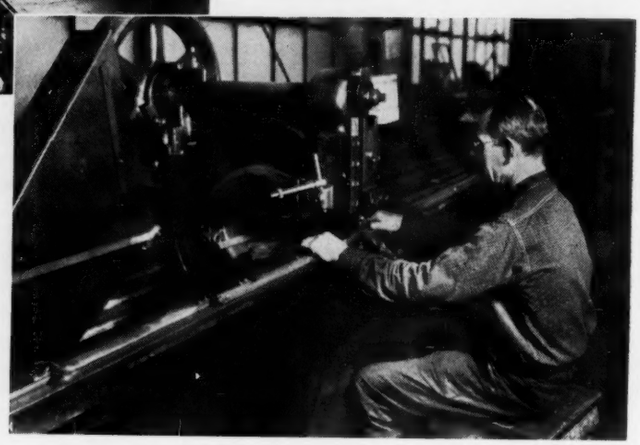


FIG 1 (above) — Templates with horseshoe gages are used for positioning in punching bolt holes. Note special device for lubricating punch. Fig. 2 (right)—Press brake with V-shaped die for bending right angled flanges on sheet edges. Special stops and spacers locate the sheet accurately. Fig. 3 (lower right)—Angles for frames are cut and notched in an open-throat press

A NUMBER of ingenious shop methods have been worked out in connection with the fabrication of parts for the all-steel gas range described in detail in STEEL for March 25, p. 26. For instance, bolts are used extensively for attaching the sheet partitions. For punching bolt holes a horseshoe gage punch with wide gap, Fig. 1, is employed. For each sheet part there is a template with holes fitted with horseshoe collars. The practice is to punch three sheets simultaneously, clamping them to the template and positioning the strokes by holding the horseshoe collars against a round stop through which the punch operates. This method entails punching one hole at a time but proves to be the least expensive under the circumstances since it permits the accomplishment of the punching operation on a small sized unit without the need for expensive machinery or dies.

By a novel lubricating device the company has been able to lengthen the life of the punch between grindings. Formerly it was necessary to grind after 250 holes had been punched, on the average, whereas it now is possible to punch approximately 1550 holes before regrinding. This economy was effected by grinding a flat surface on the side of the punch and thus creating a small opening between the punch and punchholder. From a tank attached by a bracket to one side of the punch press, lubricating oil flows through a rubber hose which connects with an opening in the punchholder. The length of the hose has been so regulated that at each down stroke the hose is elevated slightly, thus permitting a drop of oil to flow into the punchholder and down the punch to the work.

Speed Setting on Brake

Another interesting device has been worked out to speed up the operation of a new press brake with V shaped die, Fig. 2. This machine is used to bend right-angled flanges on the sides of sheets, and the distance between the male and female portions of the die is adjusted in accordance with the gage of the sheets being bent. The flanges range in width from 3/16-inch to 4 inches, and considerable delay was encountered in setting the back gage that is regular equipment on this machine. The company solved this problem by drilling holes through the female or bottom V die and attaching stops by means of bolts passing through these holes.

Between the stops and the die are spacers which regulate the width of flange. These have been machined to micrometer accuracy, and a set of them has been provided for each desired width of flange. Use of such spacers and stops not only has cut the time of setting the machine up for accurate flanging, but has increased its capacity, since it is pos-

Methods in Building

Gas Range

PART II

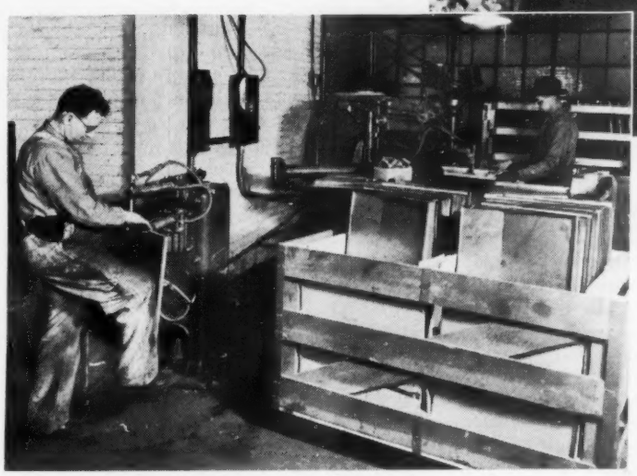


FIG. 4 (lower left) — Spot welders are used extensively for attaching small parts. In the foreground is a special caster truck for handling range sections. Fig. 5 (left) — Multiple spindle drill for drilling four ⅝-inch holes in burners. Fig. 6 (above) — Frames of cut and formed angles are assembled by arc welding in special jigs mounted on a steel plate

sible to set up on one side for one flange and on the other side for another flange. Thus, a sheet taking a 3/16-inch flange on one side and ½-inch flanges on the other sides, can be flanged all around in one setting of the press brake. Incidentally, on account of the allowance which has to be made for the width of the V die, each spacer is ⅜-inch shorter than the flange width which results from its use. For this reason, no spacer is used when making a 3/16-inch flange; instead a stop with an overhang of 3/16-inch over the V die is employed.

An interesting positioning device has been developed for shearing, punching and miter-jointing the steel angles from which the front and bottom frames are made. The front frame is of ¾ x ¾ x ⅛-inch and the base frame of 1 x 1 x ⅛-inch angles. An open throat press is employed, Fig. 3, for shearing and for cutting miter joints and a separate hand brake is used for closing the joints. Instead of the usual step gages, bar templates are used for accurate positioning of the steel angles in the shear. These bar templates are provided with spring actuated stops which are nothing more than ordinary butt hinges, case hardened to improve their wearing ability, and provided with spring clips which keep them in the open position. These spring clips are ribbons of ½-inch flat spring steel and are curved so as to increase their stiffness. One end of the butt hinge is attached to the bar template by means of countersunk machine screws; the other end, to which the spring clip is attached, is passed over the steel angle to be cut. As the end of the angle passes one of these stops, it snaps down, forming a stop against which the angle is held for the cutting operation. For backing up these stops and preventing them from weaving and loosening, steel lugs are screwed to the template alongside the stops.

These cut angles are placed in special jigs and joined by arc welding, Fig. 6, a portable unit being employed. The jigs are mounted on steel plate, ⅜-inch thick, and are made by welding steel angles to the plate so as to form channels in which the assembly is clamped in the correct position for the arc welding operation.

Forming Burner Support

Fabrication of the flat strip which supports the burner sub assembly is a simple operation. These strips are 4 feet long and are made of ⅛ x 2½-inch flat steel bars. It is necessary only to shear them to length and punch two rows of seven holes each in them. Six of these are for attaching the strip to the range top and eight for attaching the burner brackets to the strip. The punching operation is performed in a punch press equipped with twin punches and dies, thus punching two

Punching the ends of tubular handles to hold the inserted plugs for mounting on the range

holes at one time. An ordinary step gage is employed for positioning the strips for punching.

An interesting operation is the drilling of four holes simultaneously in the cast iron gas burners. For this job the company has fitted an ordinary drill press with a multiple spindle head, Fig. 5. The burner is held in a special clamping jig which comprises the bushing plate on top and a wedge plate underneath. The undersides of the bushings are cone shaped so as to center the 4-burner stools under the drills, and the wedge plate underneath clamps the casting tightly against the bushing plate. The drill press is equipped with automatic feed. Drillings fall into a pan which feeds into barrels which, when filled, are shipped to a local foundry for use as scrap.

Skids and Trucks for Handling

Adequate handling equipment is employed. For much of the work the customary floor skids are used; these are moved from one station to another by means of hydraulic lift trucks. For handling much of the work the company has specially built caster trucks which are substantially constructed of maple. Parts to be shipped out for porcelain enameling are loaded into these caster trucks, Fig. 4, which in turn are shipped by motor truck to the enameling plant. After enameling, the parts are delivered to the range plant racked up in the trucks and ready to go back to the assembly line. Use of these trucks has been found to speed handling and to prevent damage to parts.

Equipment used in the production of these ranges includes two spot welding machines capable of spot welding sheets of all gages from No. 3 to No. 28. Whereas steel angles are welded by the portable arc welding set, all welding of sheets, aside from spot welding, is done by the oxyacetylene torch. The oxyacetylene torch also is employed for all brazing operations.

Design of this range, as well as all products of Tinnerman Stove & Range Co., Cleveland, was worked out by A. H. Tinnerman, president.

Solder Penetration Of Steels Studied

A PAPER dealing with the penetration of steel by soft solder and other molten metals at temperatures up to 400 degrees Cent, presented by Dr. L. J. G. Van Ewijk at the annual meeting of the British Institute of Metals in London, March 6-7, attracted considerable attention. Investigation of the failure of a nickel-chromium steel airplane axle tube showed that the material had been weakened by intercrystalline cracks due to a soft-soldering operation.

Experiments were made with test pieces of a number of steels, by stressing the specimen during exposure to molten metals and alloys at temperatures up to 400 degrees Cent. Cracking occurred in several of the steels, and microscopic examination showed characteristic intercrystalline penetration by the molten metal. The steels varied in their behavior, certain specimens being particularly sensitive.

The tests showed clearly that nickel-chromium steels may be liable to rupture when put under stress and brought into contact with molten solder, lead, tin, zinc, cadmium, or Lipowitz alloy. For carbon steel, no such liability could be observed. Variation in temperature of the molten metal does not appreciably affect the action.

As regards the influence of heat-treatment of the steel, the few tests made suggest that tempering within the range of temperature commonly used has little effect on the sensitivity of the steel to penetration and rupture. By tempering the particular steel used at 700 degrees Cent., however, the liability to rupture under the test was greatly reduced. The attack of nickel-chromium steel by molten metals shows a close resemblance to the attack of manganese-bronze and brass as described by previous investigators. The cracks are characteristically intercrystalline, and in many cases show the penetration of the applied metal.

The fact that, in the short time of the tests described, no rupture occurs in a particular specimen does not necessarily indicate that the steel is not liable to damage when soldered or tinned in the stressed condition. The danger may still be present, and it is to be expected that, for instance, the resistance to fatigue may be decreased in such a measure that sooner or later the failure will develop.

Compare Six Samples

The reason for the different behavior of the six nickel-chromium steel samples used in the tests is not clear, according to Dr. Van Ewijk. A certain relation between the properties and sensitivity to penetration can be observed insofar that of the six samples used, the one with the lowest impact value and the coarsest grain was most liable to rupture by contact with molten metal.

In the discussion of the paper, it was pointed out that no correlation has as yet been proved between the properties of steel and the susceptibility to attack by molten metals, except to a certain extent as regards grain size. The temperature of 700 degrees Cent. mentioned in the paper as corresponding to the optimum heat treatment is not practicable in usual practice. Dr. Desch pointed out that penetration can occur even in a very strong steel.

One speaker stated that in the course of his experience he had noticed that airplane axle tubes made of 100-ton tensile strength nickel-chromium steel which had been soldered broke under a load equal to acceptance load when exerted for a long time. He also pointed out that if severe stresses are applied during the manufacture and chemical processes are afterward applied, such as pickling, the steel would crack under the chemical action. This remark brought a reference from another speaker concerning the possible effect of the previous history of steel in the course of pickling.

Roller Chain Parts Held to Close Limits in Grinding

BY EDWIN BREMER

ROLLER chains find numerous applications for transmission of power between two parallel shafts. Essentially they are constructed of two assemblies, the roller link and the pin link which in turn are formed from six and four parts respectively. The roller link is made up of two rollers, two bushings and two side bars or links, and the pin link of two pins and two side bars.

Design of the roller chain permits the various parts to be heat treated to attain maximum physical properties for the particular services they perform. Rollers and pins are carburized to provide an extremely hard, wear resisting surface while the side bars or links are heat treated to attain high tensile strength.

Because of close tolerances to which high grade roller chain must be held, manufacture of the various parts must be controlled even more closely; this is indicated clearly in the specifications for a 12-inch length of ½-inch pitch roller chain which calls for a tolerance of 0.015-inch in length. That does not seem exceptionally close, until it is recalled that the 12-inch length is comprised of 72 parts that affect pitch, which allows a tolerance of only 0.000208-inch per piece. Maintenance of such accuracy requires precision operations in which grinding plays an important part.

In the plant of the Diamond Chain & Mfg. Co., Indianapolis, one of the largest in the world devoted exclusively to the production of roller chain and sprockets, steels used in various parts are based on more than 40 years' experience, research and development.

Rods and Strip Required

Pins for the different sizes of chain are cut exactly to length in automatic machines from wire or rod of the desired diameter, purchased in rolls. The links or side bars in various sizes are made from strip steel which is fed into presses equipped with accurate dies and punches which rapidly stamp out the link blanks. The blanks then are taken to another machine which bevels the edges and punches the two holes. Bushings over which the rollers fit are made from strip steel of the desired width which is cut to length, formed around a mandrel and forced trough a die in special automatic machines. Rollers for the chains are made from seamless steel tubing cut to the proper length.

Of the various parts mentioned only two are ground, namely the bushings and the pins. Experience has indicated that variations in thickness of the strip steel from which the side-links are punched is so slight as to be negligible; hence, grinding is not necessary. The same applies to the seamless tubing from which the rollers are manufactured. In grinding the bushings centerless-type machines are employed. Fig. 1 shows one machine used in bringing small bushings 0.20-inch in diameter and 0.29-inch long within the desired diameter tolerance of plus or minus 0.0002-inch.

In that operation 0.003-inch of stock is removed, and the rate of production is 30,000 pieces per hour. As may be observed a special feeding device is used, comprising essentially a hopper into which the pieces are dumped, and a rapidly reciprocating plunger which enters the hopper at the bottom. The hopper sides taper steeply to the bottom so that it is funnel shape, and a split tube leads from the bottom of the hopper to the wheels of the grinding machine.

The split tube is just large enough to permit the bushing diameters to slide through easily by gravity, but too small to permit them to enter lengthwise. Consequently, there is a constant tendency for the bushings to clog over the end of the tube, but that is overcome by the action of the reciprocating plunger which agitates the bushings. The constant agitation keeps the end of the tube clear so that bushings in the proper position can drop down without difficulty.

Compensate for Wheel Wear

The wheel used for grinding the small bushing is 20 x 6 x 12 inches, and is 80 grit, aluminum oxide grain. Larger sized bushings ranging from 0.330 to 0.794-inch in diameter and ¾ to 1⅛ inches in length are ground on another machine of the same type as previously mentioned. On the latter bushings a little more stock is removed, namely 0.004-inch, but the tolerance to which they are held is the same, plus or minus 0.0002-inch.

Grinding production of the 0.330-inch diameter bushings is 11,000 per hour while for the 0.794-inch diameter bushings the rate is 4000 per hour. Instead of discarding the grinding wheels when they are worn down from 20 to 16½ inches, the driving pulley is changed so that the spindle speed is increased. Then the wheel is permitted to wear down to 14 inches and discarded.

Another reason for holding the bushings and pins to close tolerances is to maintain close fit between those parts and the links which are pressed together. Naturally, if there was any great variance from the press fit tolerances the pins and bushings would work loose from the links in service, and the chain would be-

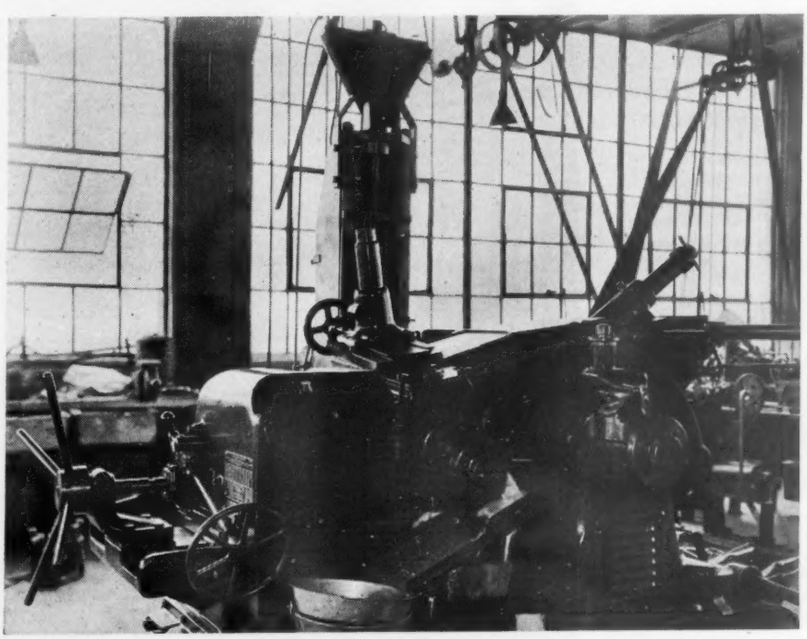


Fig. 1—Centerless grinding machine equipped with special hopper feed, used for grinding small roller chain bushings 0.20-inch in diameter and 0.29-inch long, with a tolerance of plus or minus 0.0002-inch

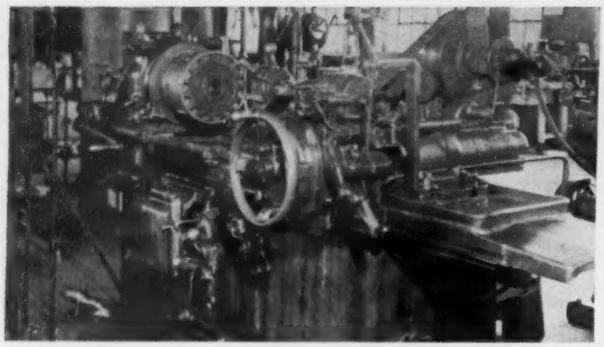


FIG. 2—Internal grinding machine with a swivel work head for finishing sides and bores of sprockets

come useless until repairs could be made.

Pins for the pin links are ground in much the same manner as the bushings, in centerless-type grinding machines. The feeding device supplying parts to the machine also is similar. Stock ranging from 0.002 to 0.005-inch is removed during the operation, and the diameters of the pins are held to within plus or minus 0.0002-inch.

While the links are not ground, they are polished to attain a fine surface finish in tumbling barrels after heat treatment in fused nitrate salt baths which provides a blue or black surface. The abrasive used in link polishing is pumice mixed with furnace oil. Small round parts for less expensive chains which do not require the accuracy of the high grade roller chains are polished in barrels also using aluminum oxide abrasive grain in furnace oil.

Rollers Are Polished

As mentioned previously, variations in size of the rollers made from seamless tubing are so slight that grinding is not necessary. However, the rollers are subjected to a polishing operation which provides an extremely smooth surface. The operation is performed on a special machine embodying a large, leather faced, wood wheel, 24 inches in diameter with a 7¼-inch face, which rotates in a vertical plane. A continuous roller chain driven by sprockets about 4 feet apart travels in a horizontal plane in front of the wheel, and it is arranged in such a manner so that the distance between the chain and the wheel may be adjusted. A steel guide is located along the wheel side of the chain.

The rollers on steel rods about 30 inches long are placed between the guide and the chain which pulls the assembly across the face of the wheel. Action of the polishing wheel, and the slight friction against the chain causes the rollers to rotate in their passage before the wheel. The polishing wheels are set up with glue and 120 grit aluminum oxide abrasive grain. This type machine is used for polishing rollers up to 0.400-inch in diameter. Larger rollers ranging from 0.470-inch up to 1½ inches in diameter are polished on vertical belt polishers, being coated with 80 grit abrasive.

In addition to manufacturing roller chains, Diamond Chain also produces sprockets of various sizes. As shown in Fig. 2, the bores of the sprockets are ground to size, and in many cases the sides are faced by grinding. The illustration shows the operation on a sprocket 9⅛ inches in diameter with a hole 2.16 inches in diameter, having a taper of 1½ inches per foot.

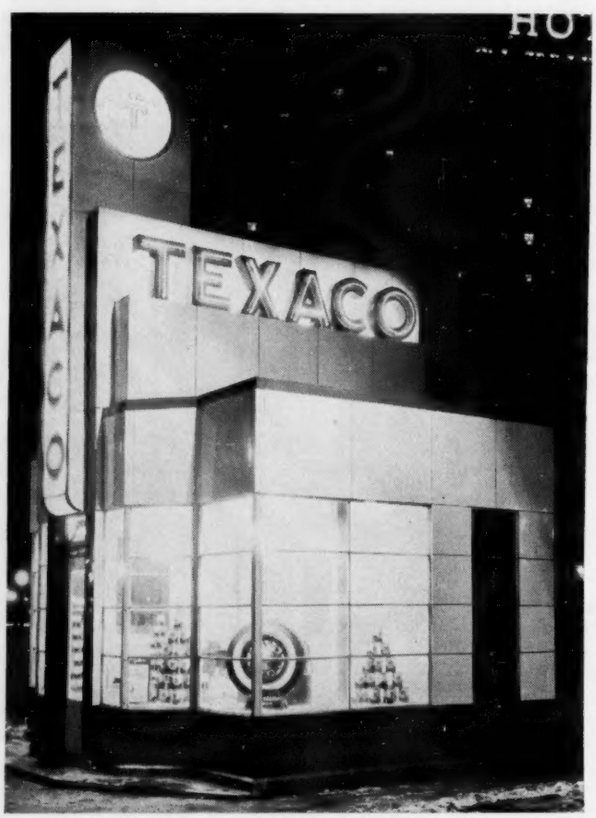
The operation is performed on an internal grinding machine with a swivel work head which permits generation of the desired taper. Approximately 0.020-inch of stock is removed, and the hole is held within plus 0.0002-inch and minus 0. The wheel used for grinding is 2 x 1¼ x ⅝-inch, 50 grit. Work speed is 400 revolutions per minute, and the production rate about 15 pieces per hour.

The company also maintains a well equipped department for the manufacture of tools and dies used for producing chain parts which in addition engages in all repair and maintenance work on those parts as well as the machines in the plant.

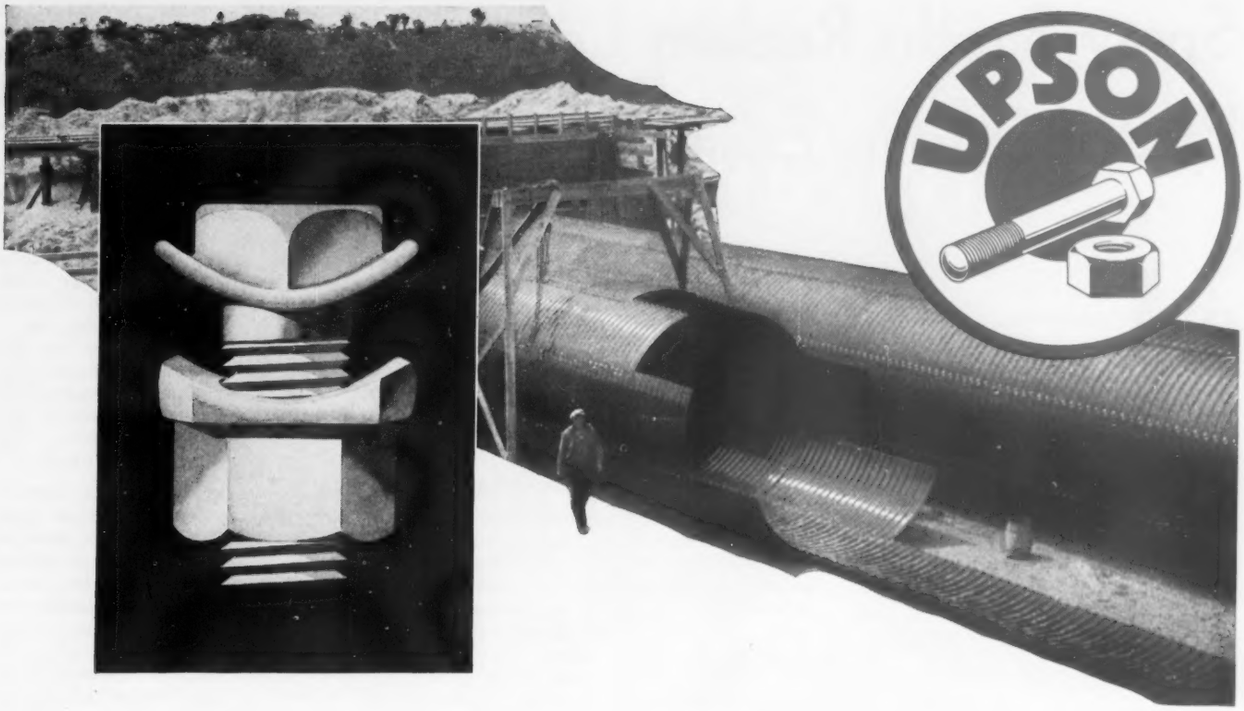
Special Welding Rods Used In Salvaging Castings

For salvaging hard white iron castings by the use of the oxyacetylene process, a producer of such cutting and welding equipment recommends the use of rods specially cast for this purpose in iron chills out of metal of substantially the same analysis as the castings. These rods can be produced by malleable foundry interests for use in reclaiming defective castings in their own shops. Preheated castings welded with such rods, it is stated, should have good appearance in view of the color match between the weld and the casting. Such welding, of course, should be done prior to malleablizing of the castings by the usual annealing and heat treatment operation.

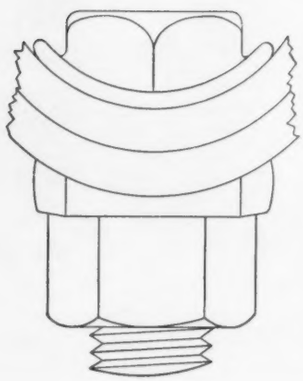
Attractive Steel Service Station



THIS STEEL AND GLASS service station, just completed by the Austin Co., Cleveland, for the Texas Distributing Co., was designed for maximum practical application of advertising display. It is of porcelain enameled steel and luminous panels in contrasting colors. It occupies a triangle at the east approach to the Detroit - Superior high level bridge, Cleveland



There *NEVER WAS* a Bolt and Nut like this *UNTIL* —



Two years ago, a manufacturer designed a new form of pipe made of curved corrugated plates, bolted together in the field. At the beginning, standard machine bolts, nuts and washers were used, but they were not satisfactory—required too much time for erection, damaged the galvanized coating and deformed the metal when wrenched-up tight.

A Republic engineer designed this special bolt with a washer integral with the head and curved to fit the contour of the corrugated plate. A separate washer with one curved and one flat side fits the other side of the corrugation. Despite the difficult heading operation, Upson has produced many hundreds of thousands of these items—has saved untold hours of labor in the field—has made sectional plate pipe a recognized factor in the development of large diameter drainage structures.

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Spray Booths Reclaim Large Part of Surplus Enamel

BY W. G. GUDE
Associate Editor, STEEL

PLANT improvements designed to effect marked economies of operation as well as to increase capacity recently were completed by the Edison General Electric Appliance Co., Chicago, large manufacturer of electric ranges. Ranges made by this company include various sizes of domestic equipment as well as the commercial and marine galley types.

Principal changes made in plant facilities concern the enameling department where new spray booths and material handling equipment have been installed. The former not only provide more healthful and efficient working conditions for operators, but also are said to be successful in reducing labor and material charges.

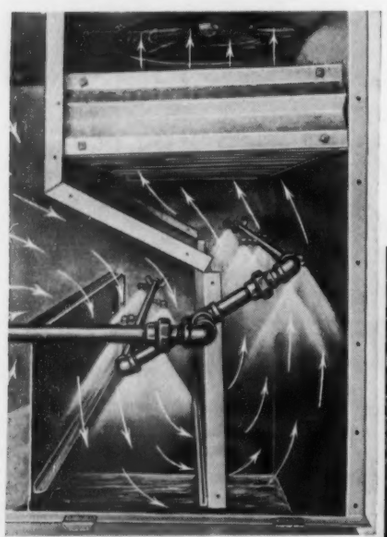
Conveyors Speed Handling

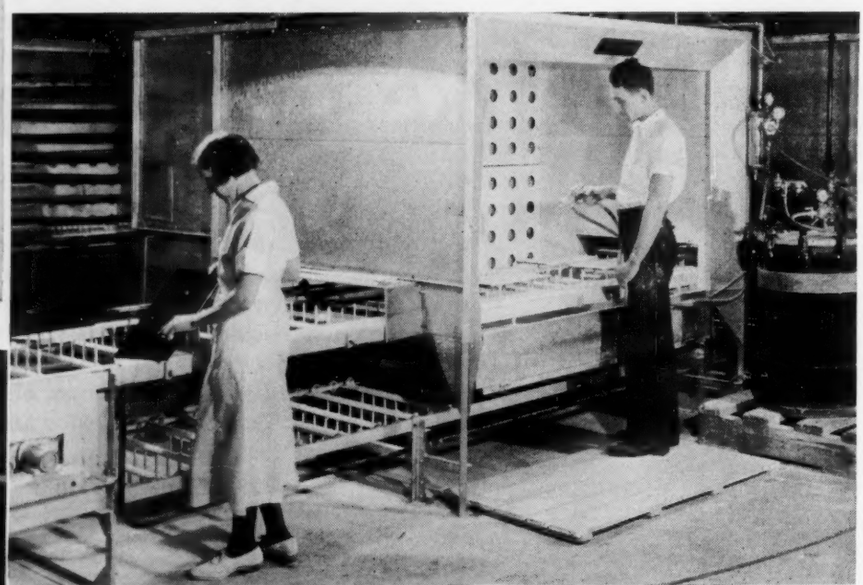
Overhead monorail conveyors have been introduced to facilitate the movement of pieces to and from the enameling booths, while endless conveyors are employed in connection with the spraying operation. In finishing the stove parts, they first are given a ground coat by dipping and then are moved by overhead conveyors to a drying oven, next being transported in a similar manner to the finishing coat department.

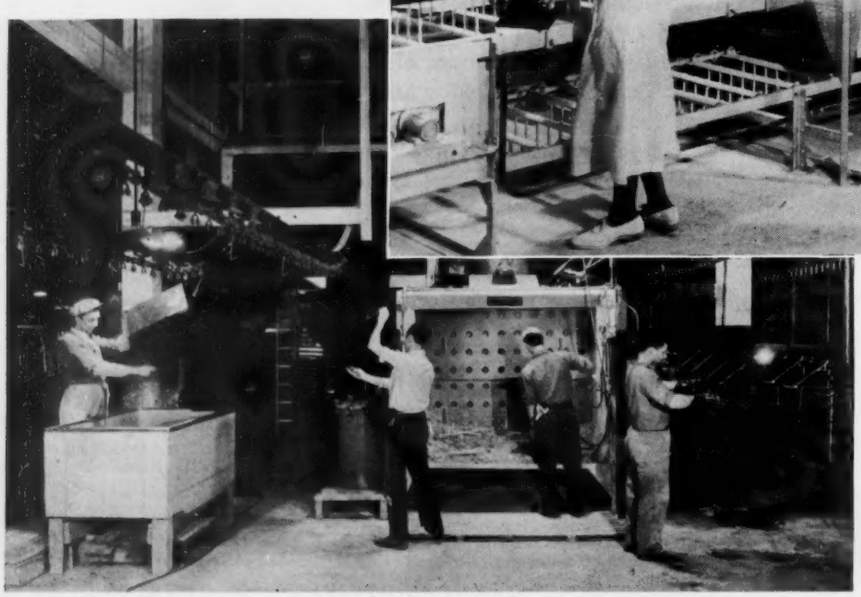
Equipment in the finishing department includes ten water-wash reclaiming-type booths designed and furnished by the Binks Mfg. Co., Chicago. Of this number six are built in pairs, the remaining four being single booths. Each of the three double booths is served by an endless conveyor, as shown in an accompanying illustration. Work brought on the overhead system is placed on the conveyor and passes through the two booths. The first operator sprays one side of the pieces which then pass on to the next booth for similar treatment on the reverse side. After spraying, the ware is loaded on a monorail truck and moved to the brushing or rimming department where surplus enamel is removed by wire brushes. The pieces finally are loaded on the conveyor trucks and transported to the fusing furnace.

The important cost-saving feature of the spraying booths is that they are designed to reclaim more than 98 per cent of the enamel which ordinarily is exhausted through the stack and lost. This is accomplished by means of a water-wash system located in an area in back of the spraying chamber. The exhaust provides an air velocity at the face of the booths of 160 cubic feet per minute, which carries loose particles of enamel through the baffle plates and away from the operator.

Upon entering the wash chamber,







CLOSEUP view (above) showing loading position and one booth of double-conveyor spraying unit. The booth reclaims surplus enamel by means of an exhaust at the rear and a water-wash system, shown diagrammatically in the inset (above left). Illustration at the left shows application of ground coat to stove sections, handled to and from the booth on overhead monorail conveyors

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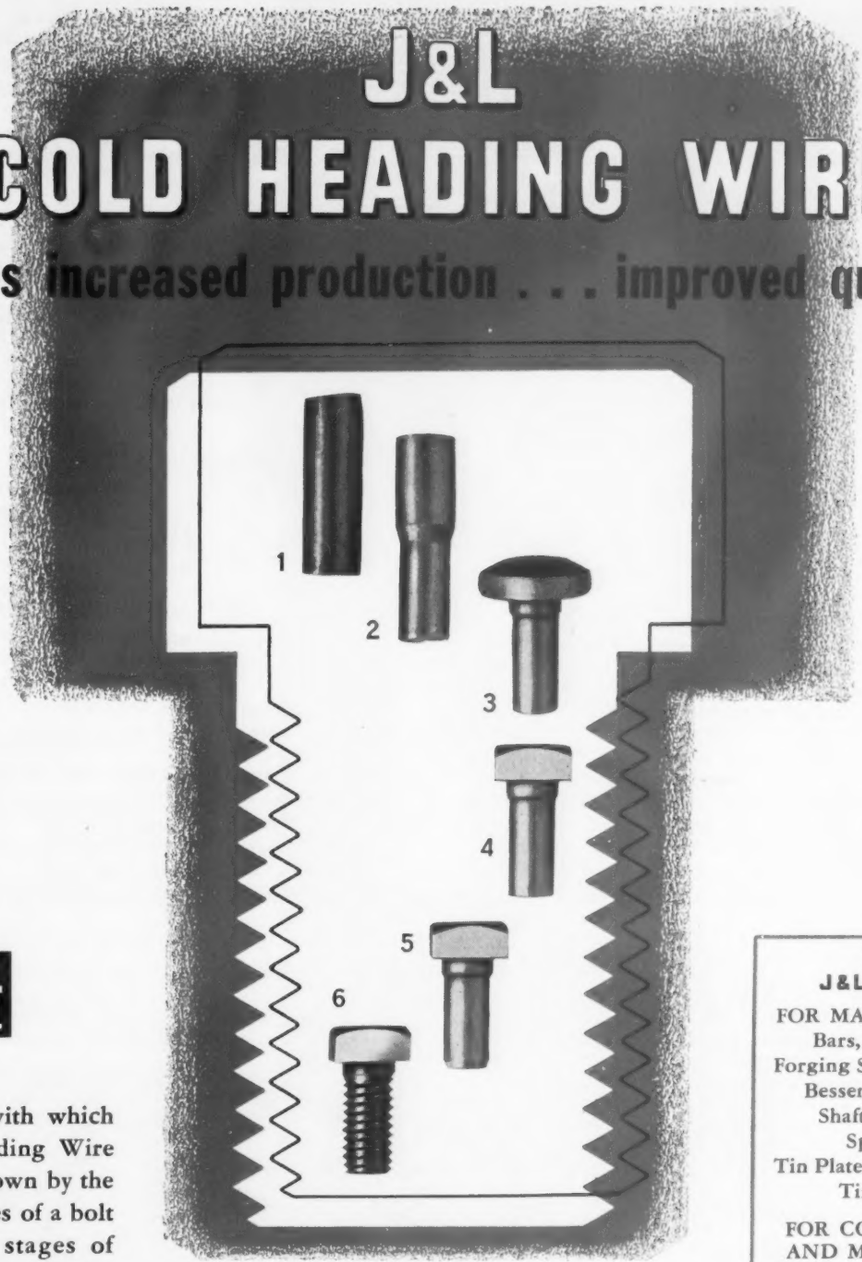

J&L STEEL

The accuracy with which J&L Cold Heading Wire makes up is shown by the progress pictures of a bolt in the several stages of forming. 1. Blank. 2. Extruded Blank, 3. Headed Blank, 4. Trimmed Head, 5. Pointed, 6. Threaded. Other parts finished or in progress, are shown below.

The high quality of J&L Cold Heading Wire is due, not to some *one* unusual factor, but to the painstaking care which Jones & Laughlin devotes to *all* the factors which enter into the manufacture of this product. We have helped many users of cold heading wire to obtain greater yield and better quality. May we consult with you concerning your application problems?

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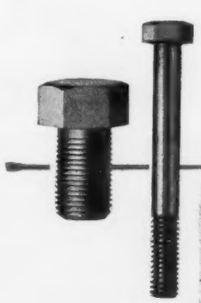

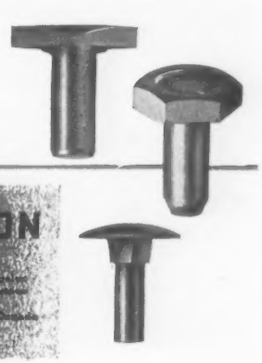

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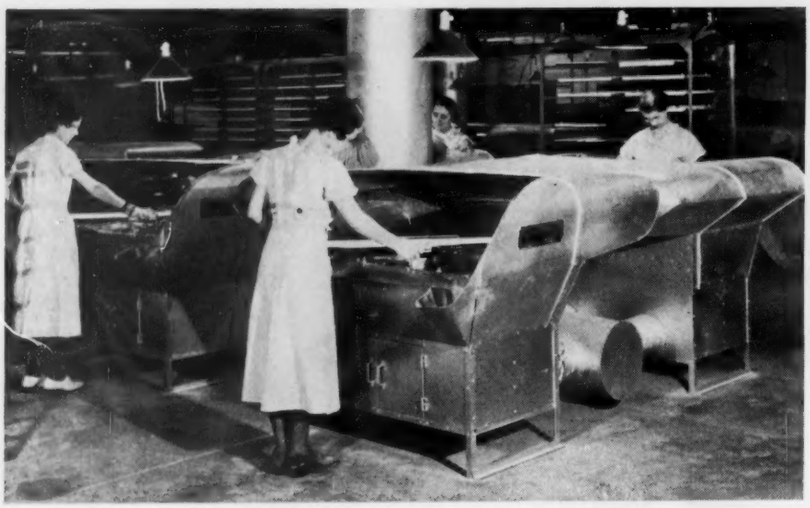


Brushing tables where excess enamel is removed by wire brushes. Enamel dust is removed by a suction system, preventing contamination of air in the room

the dust-laden air passes through an intense spray of water. Spray nozzles are a nonclogging type, developed for spray cooling towers, which break up the water by means of an involute whirl chamber and without the use of slotted disks or moving parts. Low water pressure is employed, requiring only a small pumping unit. Distributing plates cause the air to swirl downward in the front section of the chamber and upward in the rear to the exhaust duct. Another spray is located in the latter area and washes the air further. One of the illustrations shows the path of the air in the reclaiming chamber.

Before the clean air is drawn out the duct, it is passed through eliminator plates near the top of the booth. These plates separate the moisture from the air and reduce the amount of water lost. The clean-out chamber for removing the recovered enamel is easily accessible, as also are the spray manifolds and eliminator plates. The four single booths are similarly equipped with the washing system but are not fed by conveyors, as are the double booths.

Substantial savings are effected by the reclaiming process. J. F. Roche Jr., engineer for the Edison company, estimates that in an average shop a saving of over $18,000 annually is possible. Assuming an average of 9000 pounds of enamel sprayed weekly, about 4000 pounds is applied to the wares sprayed and 180 pounds, or 2 per cent, is lost up the stack. The remaining 4820 pounds represents reclaimed enamel, worth about $385. For a production year of 48 weeks, the annual saving would be about $18,500.

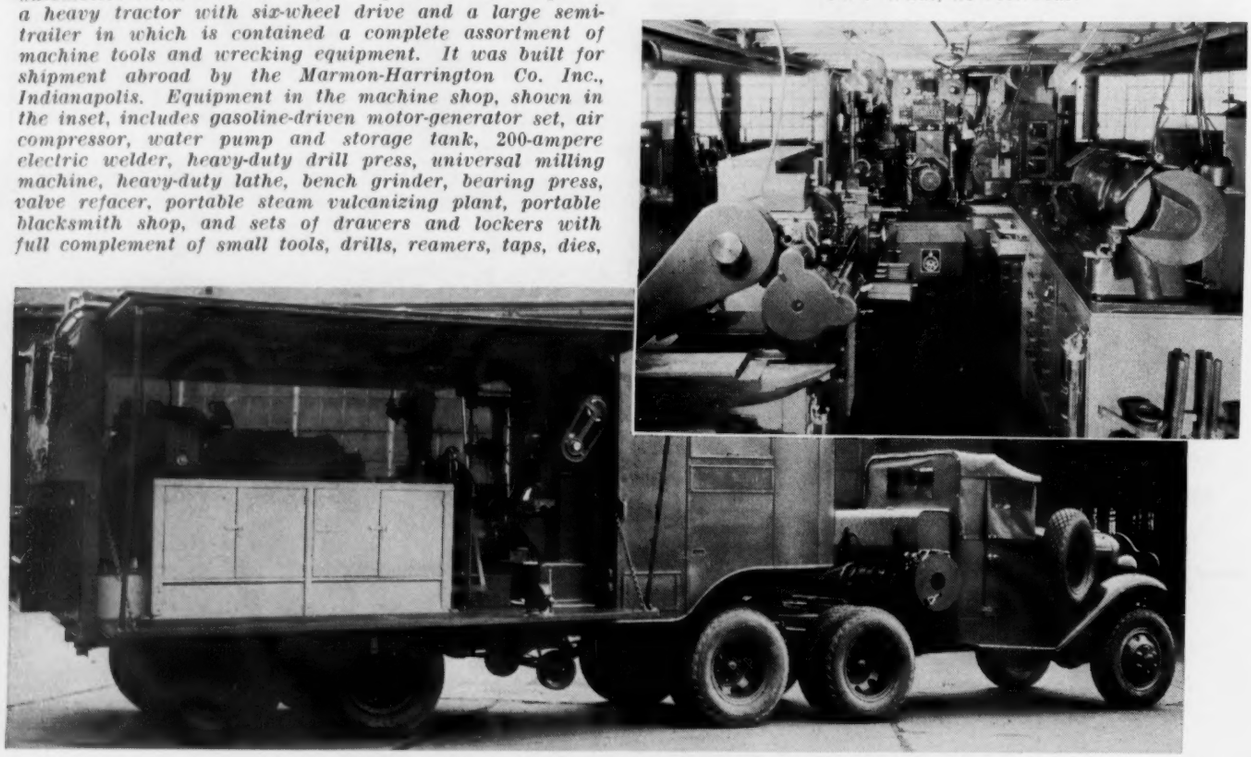
Recover Enamel Dust

Brushing tables in the rimming department, also illustrated, are of new design and were manufactured by the Binks company. This equipment is intended to safeguard workers by removing enamel dust which otherwise would accumulate on the floor or remain suspended in the air. The tables have a hood connected to an exhaust system which draws away loose particles as soon as they develop during the brushing operation.

Changes made elsewhere in the company's plant consisted mainly of a rearrangement of some existing equipment and the addition of a few metalworking units.

Brings Repair Shop to Wreck

MOBILE MACHINE SHOP: An unusual departure in automotive truck construction, this special truck comprises a heavy tractor with six-wheel drive and a large semi-trailer in which is contained a complete assortment of machine tools and wrecking equipment. It was built for shipment abroad by the Marmon-Harrington Co. Inc., Indianapolis. Equipment in the machine shop, shown in the inset, includes gasoline-driven motor-generator set, air compressor, water pump and storage tank, 200-ampere electric welder, heavy-duty drill press, universal milling machine, heavy-duty lathe, bench grinder, bearing press, valve refacer, portable steam vulcanizing plant, portable blacksmith shop, and sets of drawers and lockers with full complement of small tools, drills, reamers, taps, dies, micrometer, socket wrenches, carpenter's tools and the like. What, no restroom?



Photograph, courtesy Danly Machine Specialties, Inc. Chicago, Illinois

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New S. A. E. Specifications For Gray Iron Castings

IN CONNECTION with its program of the past year in revising S.A.E. steel specifications, the Iron and Steel division of the standards committee, Society of Automotive Engineers, also devoted attention to specifications for steel castings, malleable iron castings and gray iron castings. The new steel specifications, the first extensive revision since 1922, were presented in the April 1 issue of STEEL; herewith are reviewed the acting specifications adopted by the American Society for Testing Materials that were developed by both the producer and user interests:

Carbon Steel Castings
A. S. T. M. Spec. A27-24; A154-33T

Alloy Steel Castings (Structural)
A. S. T. M. Spec. A148-33T

Likewise, the Iron and Steel division has adopted as an S.A.E. standard specification A47-33 of the American Society for Testing Materials for malleable iron castings, in the development of which automotive interests participated.

This procedure is in conformity with the practice of the division to avoid entering fields of metallurgical standardization that are being handled efficiently by other groups, but to cooperate with such groups in the adoption of common specifications where practicable.

The new specifications for automotive gray iron castings pertain particularly to strictly automotive products, and are intended to supplement, not displace, existing gray iron specifications as developed by the American Society for Testing Materials and the American Foundrymen's association. The specifications, covering both plain and alloy cast iron, are presented in full as follows:

Table I

Plain Cast Iron—Physical Properties and Uses

S. A. E. No.	Hardness	Transverse Strength Lbs. Min.	Transverse Deflection In. Min.	Tensile Strength Lbs. Sq. In. Min.	Uses
110	¼ in. sections; Brinell,[1] 192 max. Over ¼ in., Brinell,[1] 163 max.				Miscellaneous Soft Iron Castings
111	Brinell,[1] 163 to 207	1800	0.20	30,000	Cylinders, Flywheels, Transmission cases
112	Rockwell 'B,' 98 to 106				Piston Rings

[1] Brinell hardness tests are to be made with 10 mm. ball and 3000 kg. load.

AUTOMOTIVE GRAY IRON CASTINGS

S. A. E. Standard

GENERAL INFORMATION

Scope—These specifications cover gray iron castings used in automotive and allied industries.

Workmanship and Finish — Castings shall represent good foundry practice, shall be smooth and clean and shall be free from flaws and defects. In other respects the castings shall conform to special requirements agreed to by the supplier and purchaser.

Machinability—Castings shall machine satisfactorily.

Melting Practice — If desired, melting procedure may be specified by agreement between supplier and purchaser.

PHYSICAL PROPERTIES

Hardness Test — Hardness is to be taken on the castings on those portions specified. Hardness tests are shown in tions taken in connection with castings. Of particular interest are the new specifications for automotive gray iron castings.

Adopt A.S.T.M. Specifications

By reason of the increasing use of heat treated steel castings, carbon and alloy, of which many types practically duplicate the compositions of S.A.E. wrought steels, the Iron and Steel division adopted as S.A.E. standard the latest approved specifications of the American Society for Testing Materials, as that society has thoroughly covered this field and its specifications for steel castings are entirely acceptable in every respect for both automotive and general users.

In view of the rapid and extensive advancements in the art of producing steel castings, the specification S.A.E. 1235 for medium carbon castings adopted in June, 1911, has been discontinued. For complete specifications of carbon and alloy steel castings, reference should be made to the follow-

Table II

Alloy Cast Iron—Physical Properties and Uses

S. A. E.	Hardness Brinell[1] Numbers	Transverse Strength Lbs. Min.	Transverse Deflection In.	Tensile Strength Lbs. Sq. In. Min.	Uses
120	207 to 241	2200	0.20 min.	35,000	Cylinders
121	179 to 212	2700	0.27 to 0.37	40,000	Cylinders
122	217 to 248	3300	0.30 to 0.36	45,000	Clyinders
123	212 to 241	2400	0.20 to 0.30	37,500	Cylinder liners
124	187 to 228				Brake Drums, Sprockets, Clutch Plates
125	207 to 241	2500	0.24 to 0.34	37,500	
126	228 to 269			45,000	
127	187 to 228				Pistons

[1] Brinell hardness tests are to be made with 10 mm. ball and 3000 kg. load.

NOTE: For more complete information on physical properties and other characteristics, refer to the American Foundrymen's Association and American Society for Testing Materials, Symposium on Cast Iron, 1933.

Republic GALVANNEALED

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Refrigerators, ranges, signs, water coolers, soft drink dispensers, merchandise displays, truck and bus bodies—the uses for Republic Galvannealed are increasing rapidly as fabricators of sheet metal learn more about its fine qualities. • Here is a metal sheet that is protected against corrosion by an integral coating of iron-zinc or steel-zinc alloy—that bends and draws without flaking of the protective coating—that takes paint, lacquer and enamel without expensive preparation far better than any galvanized sheet—that enables you to speed up production because of its uniform working qualities. • If these advantages lead you to think that the product you are making might be made better, at lower cost or with a better finish from Republic Galvannealed, let us know your specifications and we shall be glad to make recommendations based on past experience. A set of blue prints will enable us to talk intelligently about your product. Write today.

Republic Steel
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GENERAL OFFICES · · · YOUNGSTOWN, OHIO

Tables I and II, physical properties. If desired, by agreement between supplier and purchaser, hardness may be specified on test bars as a means of correlation with the hardness of castings.

Transverse Tests — Transverse tests are to be made on arbitration bars according to the American Society for Testing Materials specification A-48. In case the size of bar is not specified, the 1.2-inch diameter bar shall be used. The values shown in Tables I and II, physical properties, are for the 1.2-inch diameter bar.

Tensile Tests—Tensile tests are not recommended as a part of this specification except when agreed upon by both supplier and purchaser. In general, tensile tests are for information only.

Tensile test pieces are to be machined from that portion of the casting where specified. The dimensions of the test piece will be governed by the section from which it is machined. The tensile strengths given in these specifications refer to test pieces machined from castings.

If desired, tensile test pieces may be machined from arbitration bars and tested in accordance with the American Society for Testing Materials specification A-48, by agreement between supplier and purchaser.

SUGGESTED COMPOSITIONS

Analyses—Analyses, especially in the case of combined carbon, will depend to a large extent upon the section from which the drillings are taken. In all cases the location of the chemical sample should be a matter of agreement between the supplier and purchaser.

Plain Cast Iron — The analyses in Table III are typical but are *not* to be construed as required. With good foundry practice the physical properties given should be met when the indicated analysis is used, although some variations may be necessary.

Alloy Cast Iron — The analyses in Table IV are typical but are *not* to be construed as required. With good foundry practice the physical properties given should be met when the indicated analysis is used, although some variations may be necessary.

Due to specific service requirements, costs and the variables in foundry practice that influence results and also the possible variations in combinations of the alloying constituents, the kinds and amounts of the alloying elements used should be a matter of agreement between the supplier and purchaser for specific classes of castings.

In general, one or more of the elements chromium, copper, molybdenum and nickel should be used.

Table III

Plain Cast Iron—Chemical Compositions

S. A. E. No.	Total Carbon ±0.15	Combined Carbon ±0.15	Manganese ±0.10	Phosphorus	Sulphur Max.	Silicon ±0.10	Uses
110	3.45		0.60	0.30 max.	0.13	2.50	Miscellaneous Soft Iron Castings
111	3.25	0.45	0.60	0.20 max.	0.13	2.20	Cylinders, Flywheels, Transmission cases
112	3.45		0.60	0.60±0.15	0.10	2.90	Piston Rings

Microstructure as Well as Temperature Governs Hardening Characteristics

THAT a steel can be changed from a "deep hardening" to a "shallow hardening" steel, or vice versa, not only by suitably changing the temperature attained just prior to quenching, but also by changing the initial microstructure of the steel, appears possible according to data obtained recently at the national bureau of standards, Washington.

The effect of the initial structure may completely offset the effect of an increase in quenching temperature which might otherwise bring about deeper hardening in the metal, it is stated.

These conclusions are based on work in progress at the bureau on the hardening characteristics of 1 per cent carbon tool steels. It has been demonstrated that the critical quenching rate of a steel of this type may depend not only upon the grain size characteristics of austenite, the high temperature constituent of steel, but also upon the initial structure existing in the steel before it is heated for quenching and hardening.

For example, identical samples of a specific steel which was not a so-called "controlled grain size" steel, were heat treated to produce microstructures which were widely different, coarsely grained lamellar pearlite in one case, and completely sorbitic structure in the second. The pearlitic specimen, when quenched in brine from 1425 degrees Fahr., was more brittle, hardened to a greater depth and had a coarser grained fracture than the companion sorbitic specimen after being quenched from 1500 degrees Fahr.

Welding Rod Uses Nickel

The introduction of a new type of welding rod containing nickel either in the coating or in the iron or steel core, has stimulated the welding of normal steels and has made possible the use of nickel steels in large and intricate pieces of equipment requiring welding. A notable example of the latter has been the manufacture of pressure vessels for oil dewaxing at low temperatures.

Table IV

Alloy Cast Iron—Chemical Compositions

S. A. E. No.	Total Carbon ±0.15	Combined Carbon ±0.10	Manganese ±0.10	Phosphorus Max.	Sulphur Max.	Silicon ±0.10	Uses
120	3.25	0.65	0.60	0.20	0.12	2.25	Cylinders
121	3.25	0.60	0.70	0.20	0.12	2.35	Cylinders
122	3.00	0.65	0.75	0.15	0.12	2.05	Cylinders
123	3.25	0.83	0.65	0.20	0.12	2.00	Cylinderliners
124	3.15	0.50	0.60	0.20	0.12	2.00	Brake Drums, Sprockets, Clutch Plates
125	3.25	0.65	0.60	0.20	0.12	2.00	
126	2.80	0.60	0.50	0.20	0.12	2.30	
127	3.40	0.40	0.60	0.20	0.12	2.30	Pistons

METHODS AND MATERIALS

Produces Copper Paint for Corrosion Resistance

A paint, consisting of 98.3 per cent pure copper reduced to a powder of microscopic fineness which remains in suspension in a fluid carrier, is being introduced by the National Copper Paint Co., 666 Lake Shore drive, Chicago. This paint may be applied by a brush or spray gun and is adapted to the coating of all types of material which are subject to corrosion. It is said that the paint creates an unbroken protective shield and has long life in service. According to the manufacturer, 1 gallon will cover approximately 600 square feet of surface.

$ $ $

Special Alloys Stand Up Well in Refinery Service

In a Texas oil refinery replacement of steel nipples connecting running lines or gage columns to naphtha accumulators by KA_2S steel and alloy cast iron containing 14 per cent nickel has increased the life from a few months to at least more than two and one-half years. Since installation, these alloy parts have not been replaced and last inspection reveals the material is still in good condition.

$ $ $

Enamel Difficulty Traced To Lead in Castings

A manufacturer of stoves encountered serious trouble with spots of yellow material in its white and light colored cast iron enamels. In some cases, the spots appeared to be unhealed blisters, stained with the yellow material around the edges, and, if the spots were extremely large, the yellow powder could be scraped away. Chemical analysis proved this powder to consist almost entirely of lead oxide. This led to a careful examination of some of the castings after being sandblasted; finally some were found which contained small pockets of lead on the surface.

Going back into the foundry, further examination revealed that some of the outside scrap used in the cupola charge contained a number of babbitt bearings, and that the lead contained in these bearings was contaminating the iron. Careful sorting of the scrap and elimination of the parts with the bearings promptly overcame all trouble.

$ $ $

Alloyed Iron Ore Chute Liners Show Long Life

Ore chutes of nickel-chromium cast iron have shown an operating life three times that of the unalloyed material. The foundry of John F. Staver & Son, Virginia, Minn., casts chill plates for chute liners, the iron having the following composition: Total carbon, 3.30 per cent; silicon, 1.20 per cent; manganese, 0.60 per cent; sulphur, 0.10 per cent; nickel, 2.00 per cent; and chromium, 1.00 per cent.

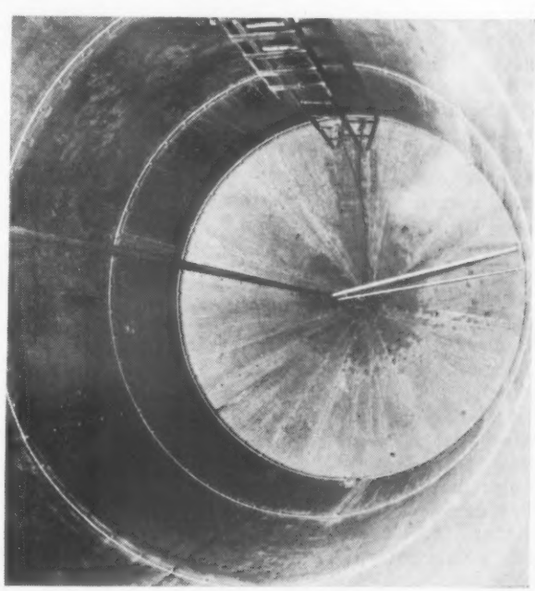
$ $ $

Hard Rammed Molds Make Good Gray Iron Castings

The extent to which green sand may be manipulated to withstand severe service is being demonstrated in an eastern foundry engaged in the production of tunnel segment castings of gray iron. The sand is rammed so hard in these molds that a man may walk over the surface of the raised mound in the drag.

Kettle Will Not Corrode

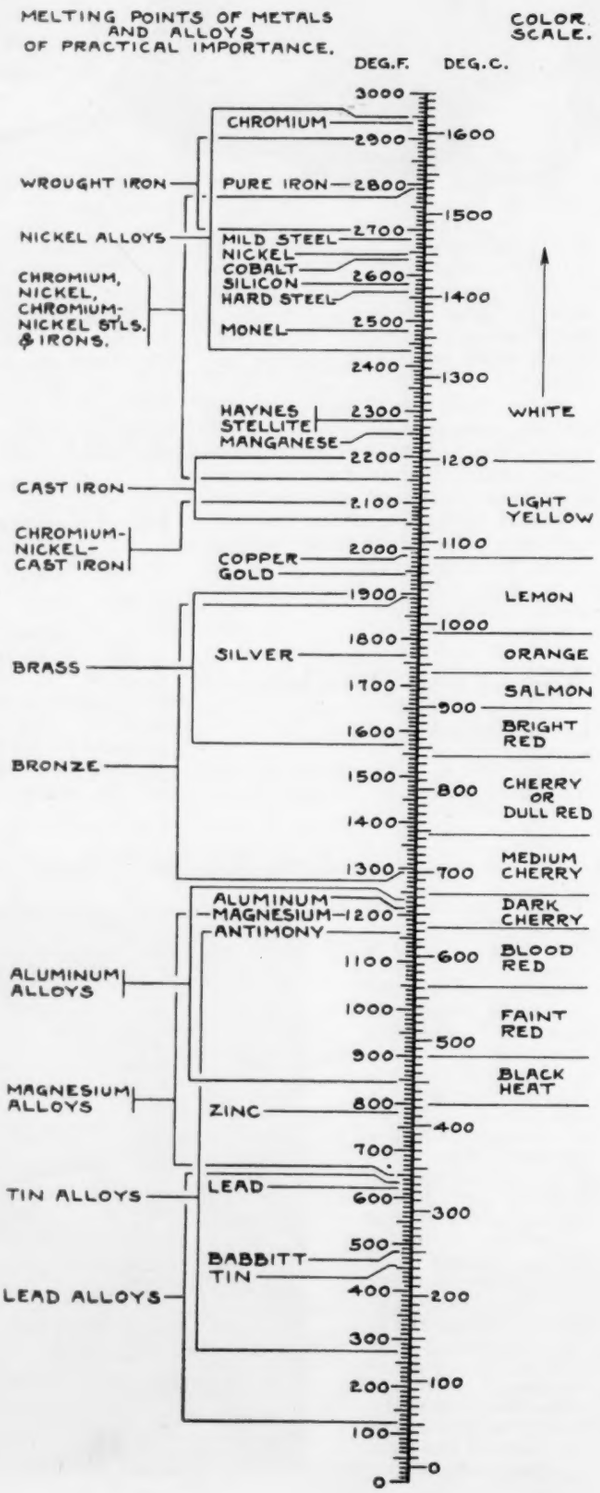
SOAP BOILING KETTLE: Nickel-clad steel was used in construction of this large kettle by the Southwest Welding & Mfg. Co., Alhambra, Calif. The kettle, comprising four courses between cover and conical bottom, is 15 feet in diameter, 29 feet in height. The 7-foot high cone at the bottom is of ⅜-inch plates; bottom vertical course of 5/16-inch plates; second and third course ¼-inch; and top course 3/16-inch. Assembly was by arc welding. Nickel-clad steel is a joint development of the International Nickel Co. Inc., New York, and the Lukens Steel Co., Coatesville, Pa.



which is not reinforced with bars, rods, or any other device. These hard molds, it is claimed, produce castings accurate in size, shape and weight; furthermore, the castings are free from scabs and blisters.

Conversion Data, Melting Points and Temperature Colors Shown on Chart

ALREADY means for converting temperatures from one scale to the other is afforded by the accompanying Fahrenheit - Centigrade chart, compiled by *Oxy-Acetylene Tips*, published by the Linde Air Products Co., New York. Melting points of various metals and alloys that are of practical importance are shown to the left of the scale. Color designations commonly used in judging the temperatures of hot metal by color are shown at the right. On the Fahrenheit scale the freezing point of water is 32 degrees and the boiling point of water is 212 degrees. On the Centigrade scale water freezes at 0 degrees and boils at 100 degrees. Thus 100 divisions on the Centigrade scale equal 180 divisions on the Fahrenheit scale. This makes 1 degree Cent. equivalent to 9/5 of 1 degree Fahr. Numerically to convert from Centigrade to Fahrenheit, 1 degree Fahr. is equal to 9/5 degree Cent. plus 32. And 1 degree Cent. is equal to 5/9 degree Fahr. minus 32. Melting points shown as single temperatures are for metals that are elements. Each group of alloys has a range of melting points due largely to the effect of even a small change in relative composition. The ranges shown are, however, indicative of the relationship in melting point between a metal and its alloys and between different groups of alloys.



The temperature color chart can, of course, merely suggest the relationship between heat colors of metals and temperatures. Observations should be made in the dark.

Use of Nickel Saves Weight in Mine Equipment

The increasing depths to which mining operations of various types are being carried have developed the weight of hoisting apparatus into a definite problem. An experiment initiated in certain French mines has proved so successful that it is being adopted in other mining areas. It is to construct the cages and ore skips of nickel alloy steel with a saving in weight, which runs in some instances as high as 30 per cent. In line with this trend is the expanding use of nickel-chromium steel for the axles of mine cars.

Radius of Curvature for Enameled Parts Studied

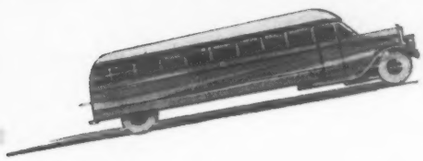
The minimum radius of curvature for enameled parts was made the subject of a recent investigation and reported upon at the recent annual meeting of the American Ceramic society in Buffalo by H. H. Holscher, Edison General Electric Appliance Co., Chicago. An abstract of this paper was presented in the March issue of *The Enamelist.*

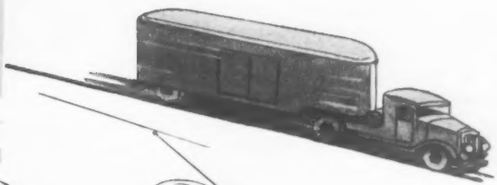
To determine just how sharply an edge could be bent without causing trouble in porcelain enamel processing, four series of panels were made of 20-gage iron with two bent edges having outside radii of bends as follows: 1/16, 5/64, 7/64 and 9/64-inch. These panels were carefully pickled and enameled with ground coat and one cover coat. The condition of the enamel over the bent edges was noted by accurately measuring the percentage of the enamel which was unsatisfactory.

Further studies consisted of producing chippage on the bends by a thermal shock test. The panels were quenched ten times from an oven at 500 degrees Fahr. to water at 50 degrees Fahr. This gave a high percentage of failure which was desired for comparative purposes. On plotting the number of chips per panel and the percentage of the enamel unsatisfactory in ground coat against the radius of the bend, two curves were obtained which tended to flat-

USS

COR-TEN





Lighter Construction with Stronger Steels

Lighter sections of stronger Steel are the key to weight-reduction and economy. Car-builders, truck-builders, bus-builders are discovering that the higher physical properties of USS High Tensile Steels permit very substantial weight-reductions with safety.

Thin-gauged material will replace heavy plates in freight car construction—thanks to the strength and unusual atmospheric corrosion-resistance to be found in this new group of Steels. Freight cars, efficiently redesigned to use these Steels, will be constructed at a cost that compares favorably with present, heavy cars.

The atmospheric corrosion resistance of U S S COR-TEN is based upon ACTUAL TESTS extending over a period of years in several different atmospheres. Our statements are based on actual experience — not upon accelerated or laboratory tests.

The various grades of U S S High Tensile Steels are available at moderate cost. Supplied in Plates, Shapes and Bars—also in Strip, Sheets, Light Plates, Rods, Wire and Wire Products, Pipe and Tubular Products. Write for full information and descriptive literature.

Address the Following Manufacturing Companies:

AMERICAN SHEET AND TIN PLATE COMPANY, *Pittsburgh* **TENNESSEE COAL, IRON & RAILROAD COMPANY**, *Birmingham*
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CARNEGIE STEEL COMPANY, *Pittsburgh* **ILLINOIS STEEL COMPANY**, *Chicago* **NATIONAL TUBE COMPANY**, *Pittsburgh*

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USS HIGH TENSILE STEELS

ten out at the 9/64-inch radius point. This means that a 9/64-inch radius is about the minimum that should be used to escape great chipping hazards.

The chipping was shown to be twice as bad on a 7/64-inch bend as on a 9/64-inch bend, and four times as bad on a 1/16-inch bend. This data applies to edges only, on corners a radius larger than 9/64-inch is recommended.

Resistance Welds for 18-8

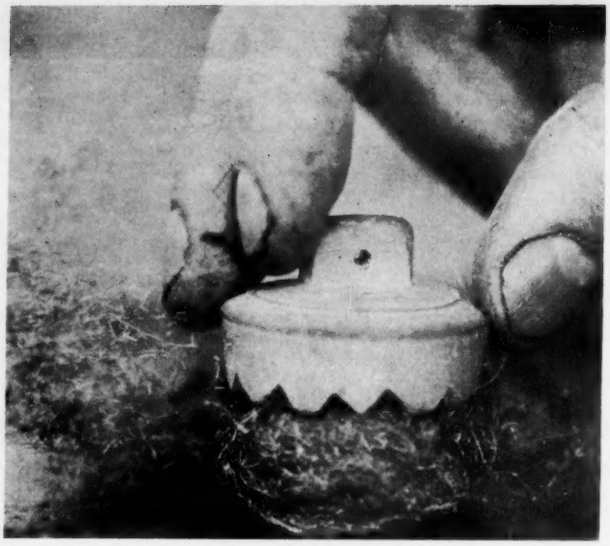
Following an extensive research investigation, a group of laboratory workers has come to the conclusion that if a welded section of 18-8 chromium-nickel steel is to be subjected to the simultaneous action of repeated stresses and corrosion, an electric resistance weld should be used to provide maximum resistance. Proper heat treatment after resistance welding also is recommended.

Saves Wear and Tear on Fingers

By Frank W. Bentley Jr.

IN THE average shop there are always a few odd jobs of cleaning and scouring for which steel wool is found efficacious. Holding steel wool during the operation, however, is not pleasant, for the fingers soon become tired from the unaccustomed work and in addition minute particles of the wool are forced into the skin to cause irritation and sometimes infection. Furthermore, it is frequently difficult to apply the steel wool so that it reaches all the desired spots.

Practically all those difficulties can be overcome by obtaining a soft rubber basin stopper of the required size and cutting its lower edge into a serrated form as shown in the accompanying illustration. This can be accomplished with an old safety razor blade. To use the device all that is necessary is to wad some pieces of the steel wool tightly together and place them under the rubber holder. The teeth will hold the wool firmly, and the cleaning operation can be accomplished with considerably less physical effort. The holder is not difficult to manipulate so that the wool can reach all spots to be cleaned or scoured and, as may be realized, the fingers suffer less fatigue and at the same time are kept clean.



AN ORDINARY soft rubber basin stopper with its edges serrated forms a handy holder for using steel wool

Cable Rings Now Made of Stainless Steel Wire

Cable rings for supporting lead-clad telephone and telegraph cables now are being manufactured by the Chance Co., Centralia, Mo., from stainless steel wire manufactured by the Bethlehem Steel Co. The grade used is Bethadur No. 2, containing 18 per cent chromium and 8 per cent nickel. Formerly these rings were made of carbon spring wire, galvanized after forming. The change was made because of the corrosive service conditions to which these cable rings frequently are exposed, as in industrial atmospheres, in tunnels and other severe locations.

To manufacture the rings, the wire first is cold-rolled to a half-oval section. This half-oval wire then is cold-formed into the finished rings by automatic machines. No special equipment was necessary to make the rings out of stainless steel wire, the process being exactly the same as that followed with carbon spring wire. It was found that the stainless steel wire responds so well to cold-working that the finished rings possess the same resilience as those made from the spring wire. At the same time they meet the severe tension and bending tests employed by the inspectors of various public utility companies.

Two of the stainless steel rings are shown in the accompanying illustration attached to a high-strength messenger strand of Bethanized zinc-coated wire for which high corrosion resisting ability is claimed.

Cable rings, formerly of carbon spring wire, hot galvanized after forming, now made of 18-8 *stainless steel*

Maps Show Location of Petroleum Refineries

Map of Petroleum Refineries of the United States; available in color in three sizes, 22 x 17 inches, 44 x 34 inches and 66 x 48 inches; paper cloth back, panel board back or roll type; published by J. H. H Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from $1.50 to $17.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This 1935 map, printed in color in all sizes, shows all the states of union divided into districts and subdistricts by those departments of the United States government holding authority over the production, refinement and distribution of petroleum and its products. These districts are heavily outlined, numbered and colored. Spotted on the map are all cities, towns and villages having petroleum refineries. A list of all firms or companies at each place also is given. Where necessary, names of

shipping points are followed by the names of local postoffices serving the plants.

The petroleum districts with administrative subdistricts, effective Nov. 1, 1934, are based upon regulations of the bureau of mines and petroleum administrative board, of the United States department of the interior and the planning and co-ordination committee.

Map of Petroleum Refineries of the United States; available in one size, 22 x 17 inches; uncolored; paper, cloth back, or panel board back; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices of $1, $2 and $2.50, respectively; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This map, printed in black and white without color, is based on the United States bureau of mines information circular of August, 1934, and shows the location of all cities, towns and villages having petroleum refineries. On the face of the map there is a list of the companies operating in each place. Locations of plants, not the offices, are shown. The bureau of mines districts, which include only those states actually engaged in the petroleum refining industry, are heavily outlined and marked by large letters.

Pier Members Torch Cut; Welded by Electric Arc

An article appearing on pages 47 and 49 of the March 11 issue of STEEL over the signature of David Boyd, assistant works manager, Dominion Bridge Co. Ltd., Montreal, Canada, described the fabrication of two pier members or shoes to be placed under the main towers of the Isle d'Orleans bridge under construction across the St. Lawrence river at Quebec. These shoes were constructed by welding together steel plates cut to shape by the oxyacetylene torch.

The article stated that welding was performed by the oxyacetylene process, when, as a matter of fact, it was done by the electric arc method. To be correct, the first sentence on page 47, left-hand column, should have read: "An interesting oxyacetylene cutting and electric arc welding job recently was completed by the Dominion Bridge Co. Ltd., Montreal, Canada." The first sentence in the right-hand column, page 47, should have read: "The grid for each pier member was arc welded in three sections, the center or transverse grid, and the two side grids; this was done by mounting the plate sections on universal fixtures and welding them, using ¼-inch covered electrodes and applying all welds in two passes."

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

Other People's Business

EVERYONE seems to want to have a go at the regulation of basing points in the steel industry. The latest study is perhaps the soundest because it started with the inquiry of how basing points got to be where they are at present. Such a study is likely to leave reasonable men with little desire to play with a complicated situation.

It is no secret that the steel industry is regulated by powerful competitive forces and not by love and kisses, as some of the politicians would seem to imagine. Efforts to dodge the effect of these competitive forces get the whole economic structure balled up beyond understanding.

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

This happened in the group of manufacturers who make about 5,000,000 pounds of welding wire a month. They wanted to soften some of the effects of competitive effort. After trying religiously to do it, the effort is now pretty well recognized as a failure—not because they did not want to do it, but because the inexorable laws of economics forced each to look out for himself.

There is considerable hope in the fact that industry, particularly the steel industry, is getting down to a basis of operation which is, at least, understandable to people engaged in the industry. Any serious study of the basing point problem will remove the cranks and professors from positions in which they might perform experiments with business that belongs to some one else.

Squirms

Residual stresses in welded metal assemblies are the basis of considerable controversy among the welding fraternity. One school of thought reasons from the premise that such stresses cannot possibly do an assembly any good and might be a cause of premature failure; therefore the stresses should be removed by heating in a furnace. Certainly the logic of this position is unassailable.

Another school of thought starts from the premise that all the plate and structural steel heretofore used has had rolling residual stresses present and that no detrimental effect has been observed due to that fact. It is pointed out that everyone who has ever machined such steel has had ample demonstration of the presence of such stresses and that they may be anything in magnitude up to but not beyond the yield point of the metal.

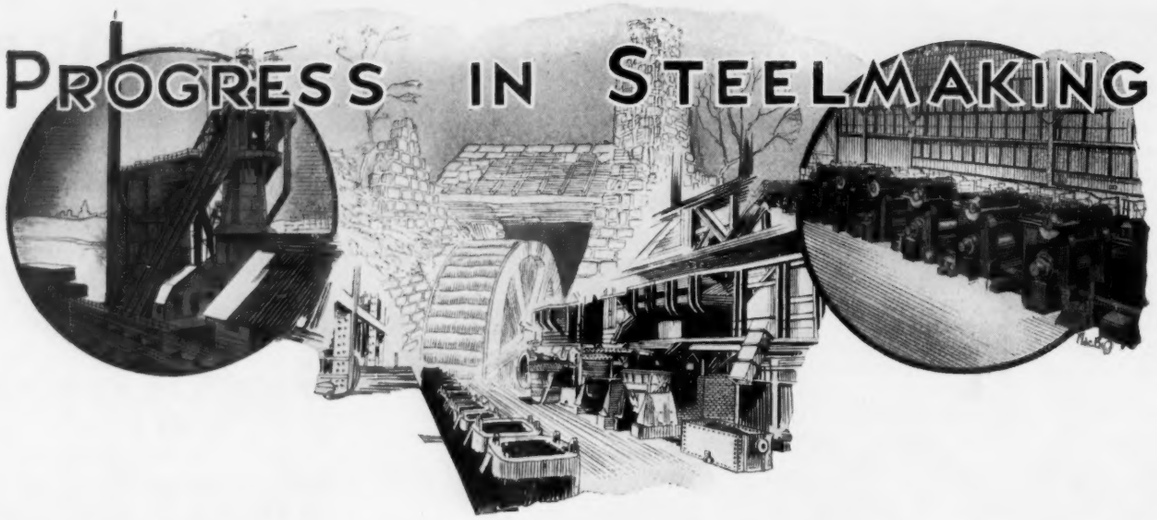
So far, evidence from the field with reference to premature failures is inconclusive for either side. There is conclusive evidence, however, that if plate or structural steel or a welded assembly is to be machined and made a part of a precision machine, a considerable amount of difficulty due to "squirming" during machining will be eliminated by stress relieving first.

Short Shorts

On welded steel machinery, of which thousands of tons are being built every year, it costs about $2000 per ton to get the weld metal on the job with arc welding. This is plain low carbon steel.

* * *

Sales of X-ray machines, furnaces, material handling equipment, sand blast equipment, air tool equipment, electric grinders, metal forming equipment and presses and many other kinds of shop equipment are increased by more widespread use of the various welding processes.



Longer Life Is Afforded

Alloy steel sheets have been found to be an improvement over plain black or galvanized sheets for roofing and siding conveyor buildings at by-product coke plants on account of their ability to withstand corrosion.

♦ ♦ ♦

Develops Special Pig Iron

For several years the continued lower market price of scrap versus pig iron in both foundry and open-hearth costs has seen some melters arrive at the condition today whereby they are including as high as 90 to 100 per cent scrap in their melt, to the virtual exclusion of pig iron. Realizing that this change is far from transient, a leading pig iron producer recently announced a special type of pig iron to be used with scrap in the melt. A special sintering process on the ore used in making this type of pig iron is claimed to give results in the pig which make it applicable for accompanying a large scrap charge.

♦ ♦ ♦

Reduces Assorting Costs

Electric equipment is used by a stripmaker to sort, according to thickness, sheets as they are cut from a coil. The strip in coil form is fed into a flying shear which cuts it into uniform lengths. Just previous to entering this shear, the strip passes between the rolls of a continuous electric gage, which utilizes an electric gage as a measuring device. As long as this gage indicates that the strip passing between its rollers is within the commercial tolerance for thickness, the cut sheets are delivered over a roller conveyor to the "stagger piler."

If the thickness of the strip exceeds the commercial limits, the indicating instrument connected to the electric gage closes one set of contacts which, through a thyratron relay, energizes a solenoid which in turn throws a switch on the roll table over which the sheets are delivered, causing the "thick" sheets to be delivered to another pile. On the other hand, if the sheets being delivered are too thin, a second thyratron and solenoid combination operates to throw a second switch, delivering the "thin" sheets to a third pile.

The good sheets, in traveling to the piler, pass between a light source and a phototube connected, to a "lot counting" relaying equipment which in turn controls a solenoid on the stagger piler. The lot counting equipment is adjustable so that the solenoid on the piler will operate after any number of sheets, from one up to ten, and this causes every group of, say ten sheets, to be offset slightly in the pile in relation to the groups immediately beneath and above it. This equipment greatly reduces inspection cost and facilitates handling of the stacks of sheared sheets.

♦ ♦ ♦

Oil Imparts High Polish

Wire coated with silicate of soda or trisodium phosphate will draw with a higher polish when oil is used than when either soap, grease or stearate is employed as a lubricant.

Four Money-Saving Ideas

Protection of steel plant overhead transmission lines against lightning can be improved, according to recent tests, by an additional wire, called a counterpoise, laid on the ground beneath it. Where the ground is rocky or dry, the counterpoise increases the effectiveness of an overhead ground wire in preventing high-voltage line flashovers due to direct lightning strokes.

♦ ♦ ♦

Handles for files and screw drivers are made to stay on tight at a steelworks machine shop by pouring a mixture of 4 parts of black resin to 1 part of beeswax with 1 quart of fine brick dust into the handle and forcing in the shank. At another shop iron furnace cement is used for the same purpose.

♦ ♦ ♦

Central systems for oxygen with piping for the distribution of this gas to consuming stations at steelworks and rolling mills are gaining favor. Painting all acetylene and fuel gas hose red and oxygen hose green is recommended. Soapy water, not matches, should be used to locate acetylene leaks. Glycerine has been found highly satisfactory as a lubricant for oxygen valves.

♦ ♦ ♦

Various greases employed for lubricating roll neck flange bearings are made of heavy black oils, soaps and various percentages of inorganic fillers such as lime, graphite, mica, talc, zinc oxide and so forth. These types of fillers impart a polish to the bearings and in a short time give a well run-in bearing surface. However, they continue to wear away the bearings, resulting in high replacement costs. In many cases, longer bearing life is secured by using extreme pressure greases free from fillers.

Therm-O-flake

HIGH TEMPERATURE INSULATION FOR OPEN-HEARTH FURNACES

WHEREVER open hearth operators and engineers gather to discuss furnaces, complete furnace insulation is an absorbing topic. Important fuel savings and longer refractories life have been definitely proven.

THERM-O-FLAKE engineers pioneered this modern practice, and, with the cooperation of leading operators, have made many allied refinements of furnace design that the industry has been quick to adopt.

An example is the "cushioned wall".

This consists of laying the furnace wall tight, without expansion joints, and placing THERM-O-FLAKE Brick between the wall and the buckstays, as illustrated.

When the wall expands, the THERM-O-FLAKE Brick compact. This preserves metal binding and insures tighter walls by eliminating the inaccuracies of expansion joints.

There are many applications of this new improvement to furnace brickwork. Write for details before your next rebuild. Experienced consultation available.

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Thermostat Protects Table Motors Against Overload

BY G. A. CALDWELL, Steel Mill Engineer,
Westinghouse Electric & Mfg. Co.

IN STEEL mills the modern tendency is to simplify and improve mechanical devices by applying highly developed electrical equipment. The requirements may be a wide range of operating speed, rapid reversals, two or more motors operating in synchronism or other similar characteristics; and as the duty cycle on the motor becomes more severe, it is evident that the necessity for accurate overload protection becomes more important and also more difficult to obtain.

For example, motors capable of reversing every two seconds made possible the electrification of roller and catcher tables, for replacing the large amount of manual handling formerly necessary in rolling sheet steel on the 2-high mills. Sheet catcher motors have three operating conditions which make the problem of overload protection extremely difficult—rapid reversals, peculiar heating characteristics, and wide variation of ambient temperature.

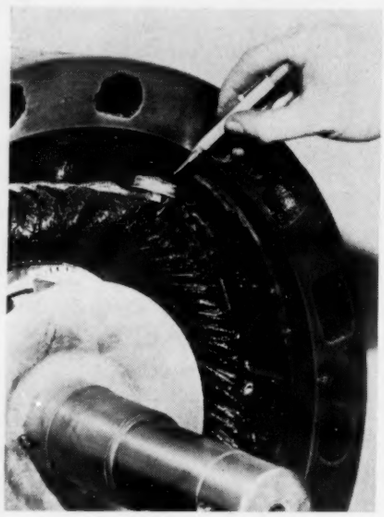

Fig. 1—Mounting a thermostat on the end windings of roller and catcher table motors affords protection against overload

Reversals Are Numerous

The first condition is the rapid reversing service. This type motor may reverse at a rate approaching 40 reversals per minute for short periods and will operate at a rate averaging 18 to 25 times per minute over an 8-hour period. The majority of the work of the motor consists in reversing the inertia load of the table and its own rotor. The continuous running load consists of overcoming friction only. Therefore, the motor current is constantly changing from light load current to the plugging current of the motor which is three to four times the full load motor current. Consequently, the heating of the motor depends upon the number of reversals per minute necessary for the particular operating schedule.

The motor characteristics are such that the root mean square current taken by the motor does not have a definite relation to the losses and consequently the heating in the motor. For 60 cycle operation, these motors have 16 poles and operate at a rather low power factor. This results in only a small difference in current from no load up to twice full load and any device responding to primary current does not indicate the actual losses or heat generated in the motor.

A third condition of operation is that the motor is subjected to wide variations of ambient temperature. The temperature in a sheet mill follows close to the outdoor temperature with winter temperatures approaching zero and summer temperatures approaching 115 to 120 degrees Fahr. In addition to this variation, the motor often is exposed to the heat radiating from the hot sheets of steel.

These conditions make it impossible for an overload relay mounted at a remote point to give satisfactory overload protection. The primary consideration is to be certain that the total temperature inside the motor is below the point at which the insulation will be damaged. Motors are rated on a basis of a certain temperature rise and whether they will be damaged by a 50 or 100 per cent overload depends to a considerable extent on the ambient temperature, type of insulation, method of ventilation and other indefinite conditions. Therefore, the most logical method to give the motors the best protection is to mount a thermostat directly in the motor to indicate the approach of a dangerous temperature.

Device Gives Warning

Fig. 1 shows a simple thermostat developed for this purpose, consisting of a bimetal disk so constructed that its contacts snap open at a given temperature and either disconnect the motor from the line by dropping out a contactor or give advance warning by means of a suitable signal that an abnormal condition exists. Fig. 2 shows a sheet catcher's table which has its motors protected by a built-in thermostat and has been in successful operation for over a year.

The roller and catcher motors are of the totally enclosed fan-cooled type and the thermostat is mounted on the end turns of the winding

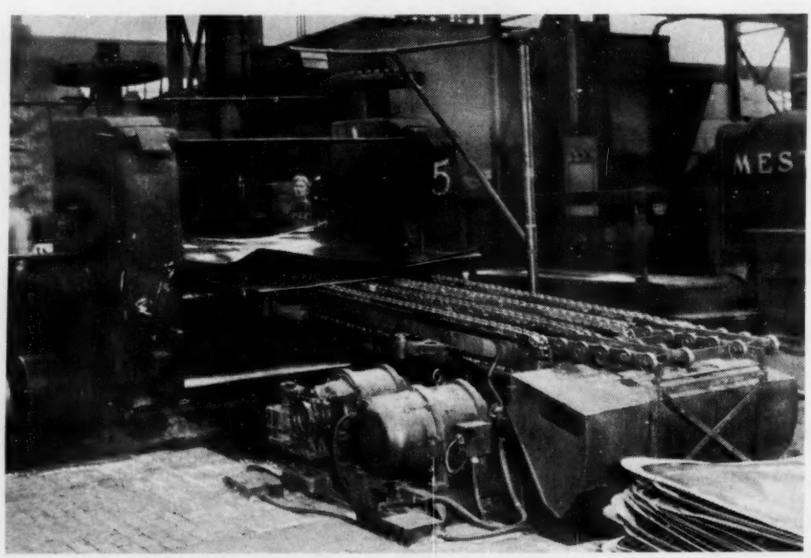

Fig. 2—Sheet mill catcher's table which is actuated by motors protected by thermostats mounted in the windings

ADVERTISING PAGES OMITTED

which are near the hot spot temperature of the motor. The thermostat leads are brought out to the conduit box in the same manner as the main motor leads.

The thermostat in this application is depended upon for the duty cycle overload protection only, and does not give complete protection against stalled rotor conditions. Due to the rapid generation of heat in the copper, there is danger of damaging the inner layers of the insulation before sufficient heat can be transmitted through the insulation and into the thermostat to cause it to operate. However, locked rotor conditions can be protected easily by a type AB De-ion breaker set to trip in approximately 3 seconds on locked rotor current. This breaker also provides short circuit protection by instantaneous trip so that this combination of apparatus gives a reliable overload protection for any operating condition.

Machine Tool Meeting in Chicago Proves Drawing Card

DEMONSTRATIONS and descriptions of latest types of high-speed production machine tools attracted an overflow crowd of more than 1000 to the annual machine shop practice meeting of the Chicago section, American Society of Mechanical Engineers, held in the Engineering building, Chicago, March 28. Afternoon and evening sessions were held, with C. B. Cole, president, Tool Equipment Sales Co., Chicago, and chairman of the machine shop practice division, presiding.

High-speed tapping machines of R. G. Haskins & Co., Chicago, were discussed by H. Goldberg, vice president. Several machines were demonstrated, including one of recent design for tapping nuts. This later unit was built to accommodate ¼ to ⅜-inch nuts, but as yet has not been introduced commercially. Working on 5/16-inch diameter, 24-pitch, nuts, it was operated at a rate of 80 pieces per minute. On smaller nuts still higher production is obtainable.

Other high-speed machines also were demonstrated and discussed relative to the selection of proper taps and oil in attaining the best production and accuracy. Mr. Goldberg stated that cutting oils have been found to play a more important part in obtaining accurate threads in high-speed work than previously had been supposed and that tests indicate that certain properties of the lubricant are lost after a period of use. Further research is being conducted.

New Units Hydraulically Driven

P. S. Jackson, assistant manager, Rockford Machine Tool Co., Rockford, Ill., described latest types of hydraulically-operated planers and slapers developed by this company. These machines, through use of the hydraulic principle, eliminate a number of mechanical parts which are subject to wear and speed the setting-up, speed-changing and machining operations. On the shaper, raising and lowering the table is accomplished hydraulically instead of by means of a manually-operated crank. Length of travel of the head is adjusted in a few seconds so that there is no interruption to the work when it is desirable to shorten or lengthen the stroke. Forward speed of the head may be varied, keeping the return travel at 150 feet minute.

Development of the thrust bearing with special reference to lubrication was discussed by H. A. S. Howarth, vice president and general manager, Kingsbury Machine Works Inc., Philadelphia. The speaker pointed out the analogy between the ordinary commercial bearing and the bone sockets of the human body, demonstrating that both employ similar principles for their operation.

Holds Machinery Increases Jobs

Mr. Howarth described early studies of friction in bearings and designs of original thrust bearings. Slides were shown illustrating applications of modern thrust bearings to various types of machinery. Tables also were presented giving the results of tests to determine the coefficient of friction with various pressures and viscosities of oil.

Machinery has increased the number of available jobs rather than reduced them, according to R. E. W. Harrison, chief machinery division, department of commerce, Washington, who spoke on "Probable Trends in the Machinery Industry of 1935." Despite the fact that a certain machine may eliminate hand labor, mechanization has made possible the development of new products and new industries which have contributed to employment, he stated.

Mr. Harrison pointed out that with the steady improvement in labor-saving devices, the number of employed persons in the United States increased from 38,000,000 in 1910 to 49,000,000 in 1930. During the same period the number of farm workers declined from 12,500,000 to 10,500,000, while industrial workers rose from 11,500,000 to 15,500,000 and service workers increased from 14,000,000 to 23,000,000. Employment of many service workers has been made possible by the development of the machines which they operate.

One factor given by Mr. Harrison for the continuation of millions of unemployed was the necessity for many, who before the depression were financially secure, to seek work because their resources had been drained.

Discussing the importation of certain products made by low-paid foreign labor, Mr. Harrison stated that further reductions in domestic costs through additional mechanization offered one method of meeting this competition. With regard to the proposed 30-hour week, he indicated that the additional labor cost and resultant increase in selling prices necessary to effect this reduction in hours would be prohibitive and would likely result in buyers' strike. Answering a question on this subject, Mr. Harrison made it plain that the federal administration never has advocated a limitation of work in industry to as low as 30 hours weekly.

New High-Speed Machine Tools

The outlook for increased sales of machinery this year was indicated by the speaker as being moderately favorable, based on expectations of leading users of tools and equipment for an improvement in their operations.

The concluding paper, on "Development of High-Speed Production Machine Tools Recently Installed in Detroit" was prepared by R. A. Schafer, chief designing engineer, development and experimental department, National Automatic Tool Co., Richmond, Ind. The talk was presented by E. E. Opel, electrical engineer of the company, due to the illness of Mr. Schafer. Electrical control adopted by the National company for use with this equipment in conjunction with the hydraulic feed system was described. Slides were shown of a number of tools developed and installed lately, principally for machining automotive parts. These parts included cylinder blocks, crankshafts, front wheel hubs and axles.

Some of the largest of these machines incorporate as many as eight separate heads, with 134 spindles, one unit machining 75 blocks per hour for a 6-cylinder motor. Operations are automatic, and complete control of each head simplifies the work and safety of the operator in setting the machine. Equipment for machining other parts, such as structural beams and valve flanges, also was described.

TIGHT FOR 8 YEARS

..what a TANK!

Sulphuric acid pickling tank constructed of long leaf yellow pine timbers with Monel Metal tie-rods, lugs, washers and nuts. Built for the Petroleum Iron Works, Sharon, Pa., by Hauser-Stander Tank Co., Cincinnati, Ohio. This tank with 8" wall timbers has inside measurements of 30" wide x 10 ft. 6" deep by 32 ft. long.

And it looks good for 8 years more, thanks to tie-rods, lugs, washers and nuts . . . . all of MONEL METAL

IT'S hard enough to make a pickling tank that's tight in every seam and joint on the day it's built.

It is quite another matter to build one that is still tight and leak-proof after 8 years of pickling with sulphuric acid . . . and still good for many more years on the same job.

Hauser-Stander Tank Co. of Cincinnati did just that when they built the tank shown above . . . did it by precision planing of each and every timber. The finished timbers are not only squarely true in section, but the faces are plane and flat for their entire length. Opposite faces are parallel throughout. This means the tank can be first assembled acid tight with minimum rod tension. Acid cannot leak between the joints to start undermining their integrity. Then they used tie-rods, lugs, washers and nuts all of rolled Monel Metal.

Monel Metal is so tough and so strong that tie-rods of this Nickel alloy can be "taken up" if necessary later after a drying period without fear of stripping the threads or of stretching the rods.

And Monel Metal so stubbornly resists the action of both acid and alkali pickling baths, whether hot or cold, that Monel Metal tie-rods are often salvaged from old tanks and used over again on new ones.

We shall be glad to send you actual reports, not only of Monel Metal tie-rods, but also of Monel Metal pickling baskets, that demonstrate the kind of gruelling conditions this equipment can stand. Just drop us a line.

THE INTERNATIONAL NICKEL COMPANY, 67 Wall Street, New York, N. Y.

MONEL METAL

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

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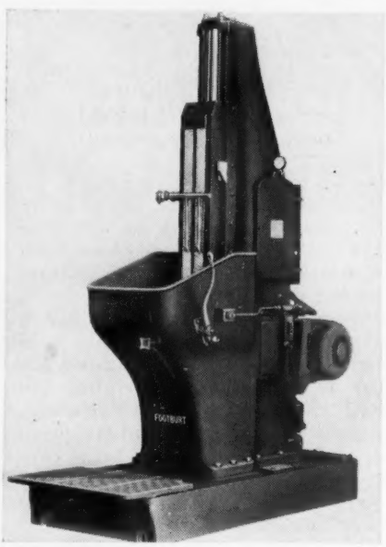
NEW EQUIPMENT

Single Slide Surface Broaching Units—

Foote-Burt Co., 13000 St. Clair avenue, Cleveland, has developed single slide vertical hydraulic surface broaching machines to complete its line. The units are built in two sizes, No. 22 with a capacity of 5 tons and shown herewith, and No. 23 which has a capacity of 10 tons.

These machines can be quickly and easily changed from the manufacture of one part to another, as only the fixture and broach holder need be changed. On plain flat surfaces often



Foote-Burt single slide vertical hydraulic surface broaching machine

the fixture only requires changing inasmuch as the broach can be designed to handle several different parts. The cutting stroke of the broach is adjustable for length by simply moving the stop dog on the broach slide, thus permitting a wide variety of parts to be handled. While this machine has been designed with the idea of making it interchangeable for various parts, high production can be obtained on small parts with limited surface area by stacking two or three pieces in a fixture and using one broach, or by placing pieces side by side and using two or three broaches side by side in the broach holder.

The broach is heavy back type construction and unusually long. It is held in its holder on the slide, making practically one solid piece and eliminating vibration. Due to the large number of teeth on the broach, an individual tooth is never burdened and dulled with heavy cuts, as the depth of the cut is distributed evenly. The lower teeth are roughers and remove the major portion of the metal; the upper teeth do the final finishing and are never used for roughing.

♦ ♦ ♦

Vertical Arc Welder—

Harnischfeger Corp., 4411 West National avenue, Milwaukee, recently brought out a 50-ampere vertical welder to answer the need for a low current machine capable of handling the lighter gage metals. The outstanding feature of this new unit, shown herewith, is the stable high-speed arc which enables it to weld quickly and efficiently down to 26 gage steels. No external reactors, resistors, or separate stabilizers are used; the self-stabilized arc is achieved through the use of an internal stabilizer winding.

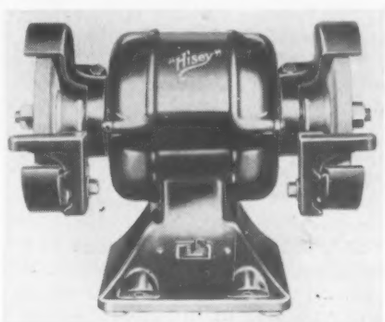
Being a motor generator unit with a 3 horsepower squirrel cage motor, it operates on any alternating-current power line including 110-volt, single phase. With current control simplified to a single adjustment dial at the top of the housing, it is suited for welding of ferrous and nonferrous metals in general repair work or for the fabrication of containers of stainless steel, phosphor bronze, aluminum, etc., with the metallic arc. The welder requires less than two feet of floor space. It is 15 inches wide and 36 inches high and is supplied with base for stationary mounting or with wheels or lifting bail for easy handling around the shop.

Fifty-ampere vertical arc welder developed by Harnischfeger Corp.

♦ ♦ ♦

Bench Grinder—

Hisey-Wolf Machine Co., Cincinnati, recently brought out 6-inch wheel bench and floor grinders of ¼ horsepower capacity. These units are suitable for numerous light tool and miscellaneous grinding jobs. Built for both direct and alternating current, these grinders are equipped with antifriction bearings with seals to exclude dust and grit. Single phase machines have an improved split-phase motor with low starting current. The pedestal available affords a height of 39 inches from floor to spindle. The accompanying illustration shows one of the new units.



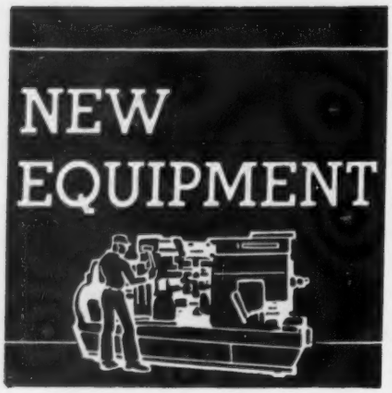
Hisey-Wolf grinder for light tool and miscellaneous grinding

♦ ♦ ♦

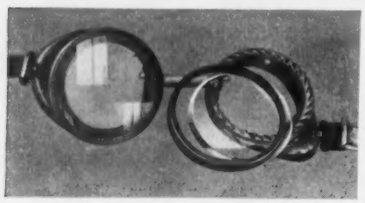
Chemical Goggle —

American Optical Co., Southbridge, Mass., is introducing a new goggle that is effectively ventilated but gives protection from splashes of dangerous liquids and the impact of flying particles. Shown on page 48, it is known as the AO Duralite-50 chemical goggle. Eyecups are molded to fit snugly to the contour of the face and so prevent liquid from entering around the goggle.

Air circulates through slots in the lens rings, through the radial slots in the eyecups and through the perfor-



ated side shields. A solid baffle plate back of the side shield is flared out on the edge nearest the lens, permitting air circulation but isolating the eyes from splashes. Adjustable rubber-covered ball chain bridge, together with the adjustable one piece headband provides for exact and comfortable fitting to individual workers. The company states that laboratory



Protection against dangerous liquids is provided by American goggle

workers, vat men, miscellaneous and other chemical workers can wear the goggle all day, in comfort, and without any fogging of the lenses. Ventilation keeps eyes cool and lenses clear, even under humid working conditions, it is claimed.

♦ ♦ ♦

Solenoid-Operated Switches—

Allen-Bradley Co., 1311 South First street, Milwaukee, recently announced that type E sheet metal enclosures now are available for its bulletin 709 switches of sizes 2 and 3. The new line of switches available in these enclosures will take care of all polyphase motor requirements up to 15 horsepower, 110 volts; 30 horsepower, 220 volts; and

Allen - Bradley solenoid switch with dust-tight enclosure

50 horsepower, 440-550 volts; as well as self-starting single-phase motors.

The type E enclosure, shown herewith, is black enameled on the outside with a white enameled interior finish which reflects the light onto all terminals, switch parts, and overload relays, thereby adding to the ease of installation and inspection. Dust-tightness is obtained with a thick felt gasket between the cover and base. This starter is suitable wherever dust-laden air is encountered, except for class 2, group D hazardous locations, where the type D dust-tight gasketless enclosure should be used.

♦ ♦ ♦

Lifting Magnet—

Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland, is announcing its new 25-inch diameter type RH lifting magnet designed for use with the smaller capacity cranes of the monorail and crawler, gasoline or electrically-operated type. The magnet, shown herewith, is of water-tight construction, both top and bottom, and has a heavily ribbed magnet case to provide a strong and durable magnet of excellent heat radiating capacity.

The coil is thoroughly insulated from the spool on which it is wound and after winding, is vacuum impregnated with moisture-repelling compound. It is securely fastened in the

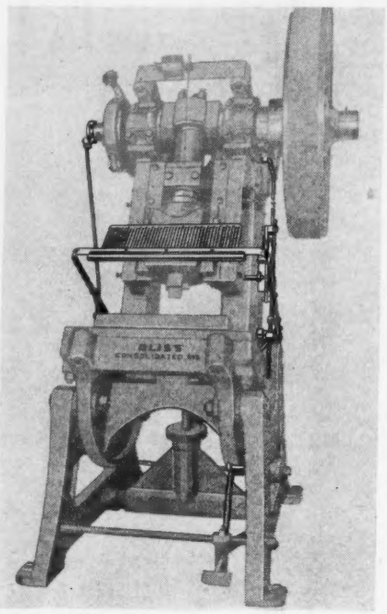
EC&M lifting magnet built for use with small capacity cranes

case by welding around the inner and outer circumferences of the bottom plate, and the magnet case is then filled with compound.

Each magnet is furnished complete with two heavy protected connecting cables and two quickly attachable, rubber covered cable connectors. For operating the magnet, No. 00 automatic-discharge magnet controller, consisting of a small, sturdy, two-position master switch and a steel safety cabinet containing the contactors and resistors, is provided.

Triple Interlock Safety Guard

Junkin Safety Appliance Co., 930-936 West Hill street, Louisville, Ky., is manufacturing a non-repeat triple interlock safety guard for use on stamping presses, shears and other equipment that is pedal operated.



Junkin non-repeat triple interlock safety guard for presses

Furthermore, the device, shown herewith, can be attached to any machine that requires a guard to keep the operator's hands from getting near the danger line.

When the pedal is pressed by the foot the guard is unlocked and falls by gravity. If the operator has his hand in the way, preventing the guard from coming all the way down, the pedal still is locked and the press will not be tripped. The press cannot be put in motion until the guard is entirely down, even if the pedal is pressed down to the floor.

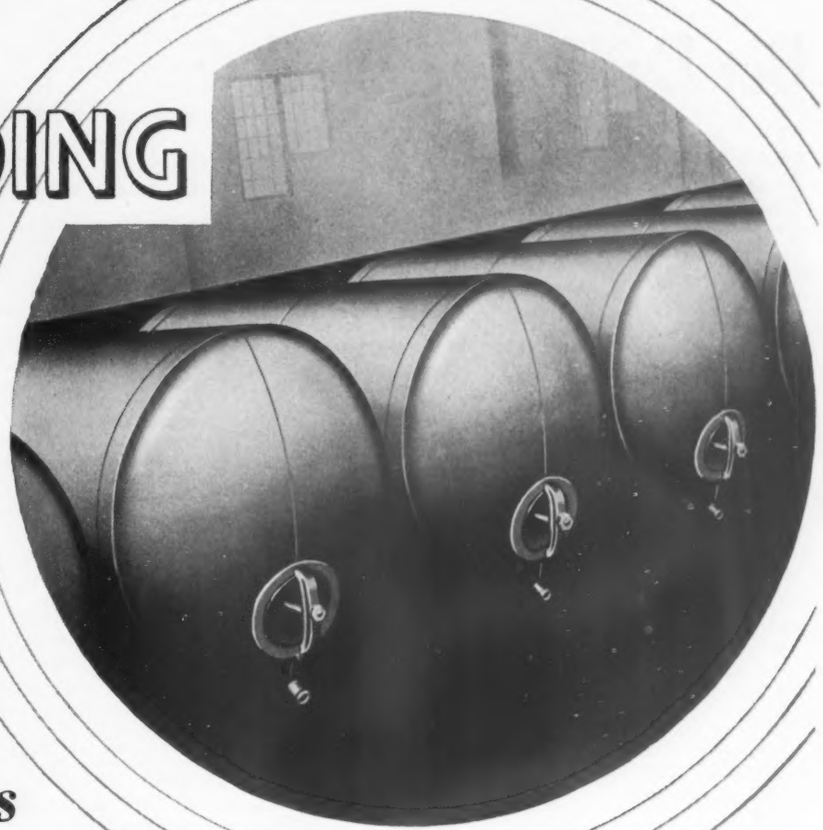
After each operation the pedal rod is detached automatically and the guard brought back to the locked position as the operating rod is interlocked with the pedal. At the same time, the clutch dog on the press itself is brought back into a release position and locked so the press cannot repeat its operation unless the guard has fallen into the safety position.

♦ ♦ ♦

Electric Cable Connectors—

Dallett Co., 165-169 Clearfield street, Philadelphia, has introduced detachable cable connectors for use with welding equipment. A cable can be connected or disconnected instantly by a quarter turn of the connector. All metal parts are fiber insulated. An expander type plug insures a wipe joint fit.

OXWELDING



makes Stainless Steel Tanks Jointless

These 1200 gallon welded tanks are of stainless steel. The stainless steel is inherently light, strong, durable, and corrosion resistant. Welding makes it jointless, easy to clean and forever tight and leakproof. These salient features could be added by no other means than welding.

Almost without exception, welding makes a good product better. Makes it more salable, more profitable at the same fabricating cost. Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through producing plants and warehouse stocks in all industrial centers. Linde also has available a vast amount of information and experience on the welding of all kinds of metals into a vast variety of products. It is available for your use.

Linde Sales Offices are located in Atlanta — Baltimore, Birmingham, Boston, Buffalo, Butte — Chicago, Cleveland — Dallas, Denver, Detroit — El Paso — Houston — Indianapolis — Kansas City — Los Angeles — Memphis, Milwaukee, Minneapolis — New Orleans, New York — Philadelphia, Phoenix, Pittsburgh, Portland, Ore.— St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa.

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Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • UNION CARBIDE FROM PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION LINDE OXWELD APPARATUS & SUPPLIES

March Iron Production Up But Daily Rate Declines

PRODUCTION of coke pig iron in the United States in March showed a substantial gain in total tonnage over February, but the average daily rate suffered a slight loss. Total production has now registered improvement for six consecutive months; the daily rate met its first setback since ironmaking turned upward last October. Contrasted to the increase of 7 active blast furnaces in February and 22 in January, the gain in March was only 1, bringing the total to 97.

Average daily production in March was 57,120 gross tons, a loss of 555 tons per day, or 0.96 per cent, from the 57,675-ton rate of February. This was the largest rate for any March since March, 1931, with 65,448 tons, and compares with the 52,438-ton rate of the same month a year ago.

The total production of 1,770,990 gross tons exceeded the February figure of 1,614,905 tons by 156,085 tons, or 9.68 per cent; however, March was a 3-day longer month than February. Total production was the largest for any month since June of last year with 1,936,897 tons, and was the largest for any March since 1931 with 2,028,906 tons. Output of March, 1934, was 1,625,588 tons.

First quarter production for the current year aggregated 4,864,338 gross tons, an increase of 742,315 tons, or 18 per cent over the 4,122,023 tons of the 1934 first quarter. In the first three months of 1933, only 1,663,865 tons was produced.

Relating production to capacity production in March was at the rate of 41.0 per cent, compared with 41.4 per cent in February and 37.5 per cent in March, one year ago.

The 97 blast furnaces making iron on March 31 was the largest number operating since May, 1934, with a total of 117. In March, one year ago, the total was also 97. During the month, 7 furnaces resumed and 6 were blown out or banked, making a net increase of 1 over the 96 active on Feb. 28. Of the non-merchant or steelworks class, 4 stacks were blown in and 6 were blown out, with a loss of 2; of the merchant class, 3 resumed and none was blown out.

Blast furnaces resuming in March were: In Pennsylvania: Steelton A, Bethlehem Steel Co.; Donora No. 2, Amercian Steel & Wire Co.; Neville Island, Davison Coke & Iron Co.; Palmerton No. 2, New Jersey Zinc Co. In New York: Standish, Chateaugay Ore & Iron Co. In Alabama: Pioneer No. 2, Republic Steel Corp. In Indiana: Madeline No. 4, Inland Steel Co.

Furnaces blown out or banked were: In Ohio: Lorain No. 1, National Tube Co.; Ohio No. 4, Carnegie Steel Co. In Pennsylvania: Bethlehem E, Bethlehem Steel Co.; Monongahela Nos. 1 and 4, National Tube Co.; Carrie No. 3, Carnegie.

With Lavino Furnace Co., Philadelphia, announcing abandonment of its Vesta furnace at Marietta, Pa., the total number of potential blast furnaces in the United States is reduced from 281 to 280. This furnace, rebuilt in 1917 and last relined in 1928, has been inactive for several years and is partially dismantled. Its product was ferromanganese and spiegeleisen; the annual capacity of the former being 25,000 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1935	1934	1933
Jan.	1,478,443	1,225,643	568,785
Feb.	1,614,905	1,270,792	553,067
Mar.	1,770,990	1,625,588	542,013
Tot. 3 mo.	4,864,338	4,122,023	1,663,865
Apr.		1,736,217	623,606
May		2,057,471	892,326
June		1,936,897	1,264,953
July		1,228,544	1,801,345
Aug.		1,060,187	1,833,265
Sept.		899,075	1,507,931
Oct.		951,353	1,358,540
Nov.		957,906	1,083,740
Dec.		1,028,006	1,192,136
Total		15,977,679	13,221,707

AVERAGE DAILY PRODUCTION

Gross Tons

	1935	1934	1933	1932
Jan.	47,692	39,537	18,348	31,336
Feb.	57,675	45,385	19,752	33,122
Mar.	57,120	52,438	17,484	31,194
Apr.		57,873	20,786	28,524
May		66,370	28,784	25,282
June		64,563	42,165	20,867
July		39,630	58,108	18,394
Aug.		34,199	59,137	17,035
Sept.		29,969	50,264	19,788
Oct.		30,689	43,824	20,795
Nov.		31,930	36,124	20,858
Dec.		33,161	38,456	17,650
Ave.	54,048	43,774	36,223	23,699

MARCH IRON PRODUCTION

	No. in blast last day of Mar.	No. in blast last day of Feb.	Total tonnage Merchant	Total tonnage Nonmerchant
Ohio	25	27	60,605	441,785
Penna.	28	28	20,235*	444,290*
Alabama	9	8	52,325	75,353
Illinois	8	8	35,482	129,800
New York	6	5	53,006	58,895
Colorado	1	1		
Indiana	8	7	18,491*	239,360
Maryland	3	3		
Virginia	1	1		
Kentucky	1	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1	8,285	133,078
West Va.	3	3		
Michigan	3	3		
Minnesota	0	0		
Missouri	0	0		
Total	97	96	248,429*	1,522,561*

*Includes ferro and spiegeleisen.

Structural Code

CLYDE G. CONLEY, president of the American Institute of Steel Construction Inc. and of the Mt. Vernon Bridge Co., Mt. Vernon, O., and C. Edwin Michael, president of the Virginia Bridge & Iron Co., Roanoke, Va., were in conference Friday in Washington with NRA officials in connection with the structural steel code, which has been hanging fire since last July. Frank Walsh, W. Jett Lauck and P. E. Morin, labor representatives, also were conferring with members of the national industrial recovery board on the code.

It is understood that labor representatives are making every effort to prevent the code from becoming effective without control of erection placed under the construction code, thus insuring labor union domination of this branch of the industry.

RATE OF OPERATION

(Relation of Production to Capacity)

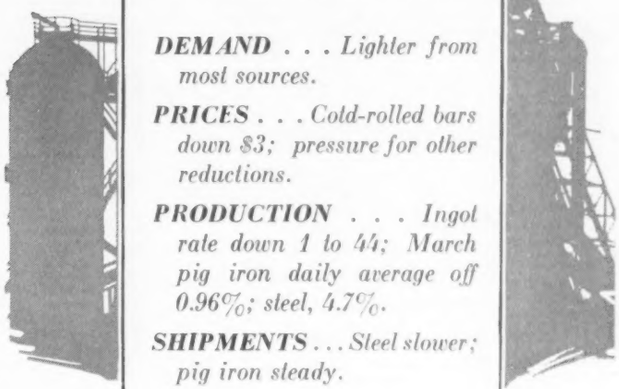
	1935[1]	1934[2]	1933[3]	1932[4]
Jan.	34.2	28.3	13.3	22.1
Feb.	41.4	32.5	14.3	23.4
Mar.	41.0	37.5	12.7	22.0
Apr.		41.4	15.1	20.2
May		47.5	20.9	17.9
June		46.3	30.6	14.7
July		28.4	42.4	13.0
Aug.		24.5	42.8	12.0
Sept.		21.5	36.4	14.0
Oct.		22.1	31.8	14.7
Nov.		22.8	26.2	14.7
Dec.		23.7	27.9	12.5

[1]Based on capacity of 50,845,741 gross tons, Dec. 31, 1934; [2]capacity of 50,975,561 tons, Dec. 31, 1933; [3]capacity of 50,313,975 tons, Dec. 31, 1932; [4]capacity of 51,598,175 tons, Dec. 31, 1931. Capacities by American Iron and Steel institute.

Treadwell Engineering Co., Easton, Pa., has delivered one cold mill for the production of narrow strip and has two more units under construction for early delivery. All three are for the production of strip steel in eastern plants. The new mills are of ring type design and were described in STEEL, May 21, 1934.

Markets Disturbed by Rail Rate Advance

Producers May Take Firmer Stand Against Pressure on Prices



MARKET IN TABLOID

DEMAND *. . . Lighter from most sources.*

PRICES *. . . Cold-rolled bars down $3; pressure for other reductions.*

PRODUCTION *. . . Ingot rate down 1 to 44; March pig iron daily average off 0.96%; steel, 4.7%.*

SHIPMENTS *. . . Steel slower; pig iron steady.*

FURTHER moderate reduction in iron and steel commitments, certainty of higher costs for producers and consumers, due to impending railroad freight rate advances, with strong pressure for lower prices, tended last week to unsettle the markets.

Among leading iron and steel manufacturers price sentiment has been strengthened by the authorized rate increases, which when formulated shortly will add at least 40 cents to assembly of materials for a ton of pig iron, and 50 to 75 cents for finished steel. They also will have to absorb higher freight charges in shipping to competitive areas, while independent of this users, who pay the freight from nearest basing points, face a 7 per cent increase, up to maximum of 45 cents a gross ton.

Caught by their own code, which prohibits price advances during a quarter, steelmakers see the possibility of still higher costs. The coal mine parley which may result in additional fuel expense has been set for June 16, twenty-six days after the date when they must decide—if the code survives—on maximum prices for third quarter.

As railroads may not take advantage of full permissible increases where water and truck competition is severe, consumers are deferring for the present all but necessary purchases. The reduction of $3 a ton on cold-finished steel bars halves the usual differential between cold and hot-rolled bars, and has led buyers of the latter to ask for a similar cut. If this should be granted it would involve plates and shapes.

The American Iron and Steel institute has refused on a technicality to accept price advances of $2 to $8 a ton filed by sheet mills on wasters and seconds, but they are going ahead selling them at the higher levels, claiming increases on these grades do not violate the code.

Railroads, barely compensated for recent wage increases, are retrenching on iron and steel purchases. March was the first month since February, 1933, in which they failed to award any freight cars. Three western roads ordered a total of 24,500 tons of rails. Structural shape awards dropped to 7140 tons.

Automobile assemblies shot up to new mark for the year, 108,000, five thousand more than in the preceding week, and largest since the last week in August, 1929. Ford and Chrysler, however, have revised downward their April schedules, to 135,000 and 70,000, respectively, while Chevrolet has raised its schedule from 118,000 to 132,000, and has set 134,000 for May.

Tapering specifications from manufacturers of consumer goods are letting steelworks operations down by easy stages. Last week the national rate was off 1 more point to 44 per cent. An increase of 4 to 50 per cent at Chicago was offset by a decline of 4 to 34 at Pittsburgh. Wheeling was down 19 to 76; Youngstown 2 to 50, and Buffalo 3 to 32. Cleveland was up 2 to 69; eastern Pennsylvania 1½ to 29½; New England 2 to 53. Detroit held 88, Birmingham 55½.

Steel ingot production in March averaged 108,873 gross tons daily, 4.7 per cent less than in February, although the extra days in March gave a total output of 2,830,700 tons, up 3.2 per cent. For the first quarter, 8,406,995 tons is a gain of 21.6 per cent over the period last year.

Daily average pig iron output in March, 57,120 gross tons, was only 0.96 per cent less than in February. It was the first month since last October in which the average failed to show a gain. Total output, 1,770,990 tons, was 9.6 per cent above February. March 31, 97 stacks were in blast, one more than Feb. 28.

STEEL's iron and steel price composite is down 3 cents, reflecting a reduction of 16 cents to $10.25 in the scrap index, while the finished steel composite remains $54.

COMPOSITE MARKET AVERAGES

	April 6	March 30	March 23	One Month Ago Mar., 1935	Three Months Ago Jan., 1935	One Year Ago Apr., 1934	Five Years Ago Apr., 1930
Iron and Steel	$32.27	$32.30	$32.33	$32.46	$32.58	$32.67	$34.16
Finished Steel	54.00	54.00	54.00	54.00	54.00	53.90	53.66
Steelworks Scrap	10.25	10.41	10.46	10.75	12.03	12.15	14.08

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Apr. 6, 1935	Mar., 1935	Jan., 1935	April, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.85c
Steel bars, Chicago	1.85	1.85	1.85	1.90
Steel bars, Philadelphia	2.09	2.09	2.09	2.15¼
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.00½	2.00½	2.00½	2.01¾
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.99¾
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.90
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.50
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	2.05
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.65
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.25
Plain wire, Pittsburgh	2.30	2.30	2.30	2.25
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.50

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.40
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.40
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.80
Wire rods, Pittsburgh	38.00	38.00	38.00	37.20

Pig Iron

	Apr. 6, 1935	Mar., 1935	Jan., 1935	April, 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.56
Basic, Valley	18.00	18.00	18.00	17.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	19.51
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	19.06
No. 2 foundry, Chicago	18.50	18.50	18.50	18.25
Southern No. 2, Birmingham	14.50	14.50	14.50	14.25
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	20.38
Malleable, Valley	18.50	18.50	18.50	18.10
Malleable, Chicago	18.50	18.50	18.50	18.25
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.66
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.68

Scrap

Heavy melting steel, Pittsburgh	$11.75	$12.40	$13.50	$14.15
Heavy melt. steel, No. 2, east. Pa.	9.00	9.15	9.70	9.50
Heavy melting steel, Chicago	10.25	10.50	12.15	11.75
Rails for rolling, Chicago	11.25	11.65	12.90	12.75
Railroad steel specialties, Chicago	11.25	11.65	13.40	12.75

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.30
Connellsville, foundry, ovens	4.60	4.60	4.60	4.55
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined..	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

*10,000 to 19,999 lbs.	1.95c
*20,000 to 59,999 lbs.	1.90c
*60,000 to 99,999 lbs.	1.85c
*100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9250.....Carbon base plus extras	

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered..	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass..	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi....	$35.00
Do., reroll. qual....	34.00
Angle bars, mills....	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base.....	3.55c
Tie plates, base.....	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland..	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts. Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago..	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown..	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt..	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point....	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del..	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
*Solvent naphtha	30.00c
*Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)..	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Po.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	14.50	13.50	19.06
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham..	21.30	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O...	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem..	20.89	21.39	.....	.....
Philadelphia from Birmingham..	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Granite City, Ill....	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17,-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead New York	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Mar. 30	9.00	9.12½	7.60	47.60	47.20	3.65	3.50	3.90	*19.00	14.50	35.00
April 1	9.00	9.12½	7.60	47.85	47.35	3.65	3.50	3.90	*19.00	14.50	35.00
April 2	9.00	9.12½	7.60	47.95	47.45	3.65	3.50	3.90	*19.00	14.50	35.00
April 3	9.00	9.12½	7.60	48.40	48.00	3.65	3.50	3.90	*19.00	14.50	35.00
April 4	9.00	9.12½	7.60	49.45	49.00	3.60	3.50	3.90	*19.00	14.25	35.00
April 5	9.00	9.12½	7.60	49.50	49.10	3.60	3.50	3.90	*19.00	14.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c *Conn. copper.*

Sheets

Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50

Tubes and Pipes

High yellow brass	16.00
Seamless copper	16.25

Rods

High yellow brass	12.75
Copper, hot rolled	13.25

Anodes

Copper, untrimmed	13.75

Wire

Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	4.37½-4.62½
*Cleveland	5.25- 5.50
Chicago	4.50- 4.75
St. Louis	4.75- 5.00

Heavy Copper and Wire

New York	5.87½-6.12½
*Chicago, No. 1	5.75- 6.00
*Cleveland	5.75- 6.00
*St. Louis	5.50- 5.67½

Composition Brass Borings

New York	3.87½-4.12½

Light Copper

New York	4.62½-4.87½
Chicago	4.37½-4.62½
Cleveland	4.75- 5.00
St. Louis	5.00- 5.12½

Light Brass

*Chicago	2.25- 2.50
*Cleveland	2.50- 2.75

Lead

New York	2.70- 2.80
Cleveland	2.50- 2.75
*Chicago	2.62½-2.87½
St. Louis	2.75- 3.00

Zinc

New York	1.87½-2.12½
*Cleveland	2.00- 2.25
St. Louis	1.75- 2.00

Aluminum

Borings, Cleveland	8.00- 8.25
Mixed, cast, Clev.	11.75-12.25
Mixed, cast, St. L.	12.75-13.00
*Clips, soft, Clev.	13.50-13.75

SECONDARY METALS

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.50- 8.75
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	9.00- 9.25
Chicago, No. 1	10.00-10.25
Cleveland, No. 1	9.50-10.00
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	8.75- 9.25
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.00- 7.50
N. Y., deal. No. 2	7.50
N. Y., deal. barge	9.00
Pittsburgh, No. 1	11.50-12.00
Pittsburgh, No. 2	10.00-10.50
St. Louis	7.25- 7.75
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo, dealers	9.00- 9.25
Chicago, factory	9.00- 9.50
Chicago, dealer	8.00- 8.50
Cleveland	9.00- 9.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.25-11.75
St. Louis	7.00- 7.25
Valleys	11.75-12.00

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.50- 7.00
Pittsburgh	10.00-10.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	12.00-12.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.50-12.00
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	10.00-10.25
Pittsburgh	12.00-12.50
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.00- 8.50
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.50-12.00
Eastern Pa.	13.50-14.00
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	12.75-13.25

FROGS, SWITCHES

Chicago	10.00-10.50
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	10.00-10.25
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1, net	9.00- 9.50
Chicago, No. 2	10.00-10.25
Cincinnati, No. 2	8.00- 8.50
Eastern Pa.	10.50-11.00
N. Y., No. 1, deal.	7.25- 7.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	9.00- 9.25
Chicago, No. 1	8.50- 9.00
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.50- 7.00
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	11.00-11.50

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	1.00- 1.25
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.00- 6.50
Detroit	3.50- 4.00
Eastern Pa.	6.00- 6.50
New York, dealers	1.75- 2.25
Pittsburgh	7.50- 8.00
St. Louis	3.00- 3.50
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	6.50- 7.00
Detroit	4.75- 5.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.50- 9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.25
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	11.00-11.50
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	10.00-10.50
Cleveland	7.00- 7.50
Eastern Pa.	9.00- 9.50
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.50-17.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50-17.00
New York, dealers	12.50-13.00
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00- 9.00
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	11.50-12.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50-14.00
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.25- 9.75

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.25
Buffalo, mach.	10.50-11.00
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.50- 9.00
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.00
Pittsburgh, cupola	11.50-12.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.25- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.50- 9.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y., break. deal.	5.25- 5.75
Pittsburgh	10.50-11.00

MALLEABLE

Birmingham, R. R.	8.50- 9.50
Boston, consum.	12.00-12.50
Buffalo	12.50-13.00
Chicago, R. R.	13.00-13.50
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	10.00-10.50
Chicago	11.00-11.50
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	12.00-12.50
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.25-2.80c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.71c
Boston	3.85c-4.00c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.35c
Detroit	3.63½c
Los Ang.(f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.30c
Portland (f)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April, 4

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.16 3 2 6	$13.99	1 14 0
Basic bessemer	13.34 2 15 0*	12.67	1 12 0
Hematite, Phos. .03-.05	15.16 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.68 5 10 0	$19.33	2 7 0
Wire rods, No. 5 gage	37.83 7 16 0	37.04	4 10 0
FINISHED STEEL			
Standard rails	$37.59 7 15 0	$45.88	5 10 0
Merchant bars	1.63c 7 10 0	1.17c to 1.22c	3 2 6 to 3 5 0
Structural shapes	1.60c 7 7 6	1.15c	3 1 6
Plates, †¼ in. or 5 mm.	1.74c 8 0 0	1.54c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.01c 9 5 0	2.16c	5 16 0††
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	2.42c	6 10 0
Bands and strips	1.84c 8 10 0	1.49c	4 0 0
Plain wire, base	2.01c 9 5 0	1.99c	5 7 6
Galvanized wire, base	2.44c 11 5 0	2.33c to 2.37c	6 5 6 to 6 7 6
Wire nails, base	2.60c 12 0 0	2.15c	5 15 0
Tin plate, box 108 lbs.	$ 4.34 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.37	3 7 6	(a) $17.16	260	$10.51	310	$25.30	63
Basic bessemer pig iron	16.37	3 7 6	(a)* 12.21	185	9.49	280	27.91	(b)69.50
Furnace coke	4.00	0 16 6	7.92	120	3.73	110	7.63	19
Billets	26.68	5 10 0	28.38	430	14.92	440	38.76	96.50
Standard rails	1.79c	8 5 0	2.08c	694	1.65c	1,100	2.40c	132
Merchant bars	1.87c	8 12 0	1.68c	560	.83c	550	2.00c	110
Structural shapes	1.90c	8 15 0	1.65c	550	.83c	550	1.96c	107.50
Plates, †¼-in. or 5 mm.	1.97c	9 1 3	2.10c	700	1.05c	700	2.31c	127
Sheets, black	2.28c	10 10 0§	2.55c	850‡	1.16c	775‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.82c	13 0 0	4.05c	1,350	2.25c	1,500	6.73c	370
Plain wire	2.01c	9 5 0	3.39c	1,130	1.65c	1,100	3.15c	173
Bands and strips	2.03c	9 7 0	1.95c	650	1.05c	700	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 69 per cent over paper sterling.

Bars

Bar Prices, Page 52

Pittsburgh — Nonintegrated cold-drawn bar producers last week were exerting considerable pressure on hot-rolled bar producers to reduce the 1.80c base on hot-rolled merchant bars, to maintain the spread between hot-rolled and cold-drawn bars, in view of the latter market's $3 a ton reduction. Hot-rolled bar prices, however, are steady. Little change has occurred in alloy steel bars, which are holding at 2.45c, mill, and are fairly well sustained on a good volume of automotive purchasing.

Cleveland—Soft steel bars hold at 1.85c, base, Cleveland, notwithstanding the reduction of $3 a ton in cold-finished bars. The impending advance in freight rates is tending to strengthen price sentiment. Not only will finished steel production costs be raised about 75 cents a ton, but sellers will have to absorb more freight in competing outside their own immediate territories. Forge shops and partsmakers report releases from automobile manufacturers slower, and bar specifications are more miscellaneous. The Cleveland Tractor Co., Cleveland, will require a round tonnage of steel for 665 tractors booked for the department of agriculture.

Chicago—Recession in steel bar demand is gradual and sales and specifications still compare favorably with the average for first quarter. The automotive industry still accounts for a large portion of the decrease in bar demand, but in view of the maintenance of motor car assemblies at a high rate, a resumption in bar purchasing is anticipated. Orders from the farm implement industry are steady, and better demand is appearing from road machinery manufacturers.

Boston—Alloy and cold-finished bar demand is spotty, but slightly heavier than for other bar products. Bolt and nut makers are ordering sparingly. Most larger consumers are buying only small lots.

New York—The steel bar market is quiet with the recent reduction in cold-finished prices exerting a depressing influence.

Philadelphia—The $3 reduction in cold-finished bars has tended to unsettle the local bar market generally. Consumers of commercial steel bars, as well as cold-finished, are marking time. There may be anticipatory buying because of the impending freight rate increase, but to date there has been little. Under the new schedule the local delivered price from Pittsburgh will be 31 cents per 100 pounds, against 29 cents now.

Plates

Plate Prices, Page 52

Pittsburgh—Volume of Ohio river barge repair work exceeds that of any other recent year. One of the most promising plate inquiries should be out for bids soon when T. R. Tarn, Pittsburgh architect, will have completed plans on six to nine gasoline barges for American Oil Co., Baltimore, that may take as much as 2000 tons of plates. Tank makers report a few small PWA-financed jobs in nearby localities, but individually these are under 50 tons. The 1.80c, Pittsburgh, base is steady.

Cleveland — Orders during the week were smaller, and plate mill operations are down to about 25 per cent. Railroad business is light. They report that the authorized freight advance will compensate them only for the 5 per cent increase in railroad wages. Users and fabricators of small tanks of various descriptions are doing considerable figuring.

Chicago—Plates continue slow, orders coming principally from fabricators and miscellaneous consumers. Requirements of railroads and equipment builders are light. Tank work generally is slow, both for municipalities and industrial uses.

Boston—Lack of tonnage projects restricts plate buying to small lots. Railroads have covered second quarter needs with indications of light specifications. Plates, delivered, Boston, are 2.20c.

New York — Plate demand is expanding moderately, due principally to small, miscellaneous requirements. Sun Shipbuilding Co., Chester, Pa., appears low on two tankers for Gulf Refining Co., New York, requiring 8000 tons of plates, shapes and bars, although the award is delayed. Tank inquiry is featured by 750 to 1500 tons of plates for small tanks for the Standard Oil Co. of New Jersey. The inquiry calls for 2500 to 5000 tanks of 550 gallons capacity.

Philadelphia — Plate demand showed some improvement last week from tank and some electrical equipment manufacturers. Pennsylvania railroad closed on 300 tons of liner plates for a tunnel in Baltimore to Truscon Steel Co., Youngstown, O. The freight rate increase will lift the local delivered price about ½-cent to 1.99c, Philadelphia, against the existing price of 1.98½c.

San Francisco—Plate bookings are restricted to lots of less than 100 tons. Western Pipe & Steel Co., Los Angeles, is low on 3500 tons for a 32-inch welded pipe line for the metropolitan water district, Los Angeles. A pipe line, up for bids shortly, at Eureka, Calif., will require close to 1600 tons.

Seattle — Commercial Boiler Works, Seattle, has taken 400 tons of 5/16 and ⅜-inch plates for 69 tanks for Century Brewing association, Seattle. Beall Pipe & Tank Co., Portland, Oreg., is building 15 truck tanks and fittings for the Texas Co., and a number of other gas and oil tanks for miscellaneous interests. A distinct improvement is noted in demand for plates from industrial sources.

Contrcats Placed

3725 tons, armor plate for ordnance department, navy, Washington; 2241 tons to Bethlehem Steel Co., Bethlehem, Pa.; 1259 tons to Midvale Co., Nicetown, Philadelphia; 225 tons to Carnegie Steel Co., Pittsburgh.

620 tons, six coal barges, Leetsdale, Pa., for J. F. Klein Co., to Ingalls Iron Works, Birmingham, Ala.

435 tons, 600,000-cubic foot gas holder, LaCrosse, Wis., to Stacey Bros. Gas Construction Co., Cincinnati.

400 tons, 69 tanks for Century Brewing Association, Seattle, to Commercial Boiler Works, Seattle.

300 tons, liner plates for Pennsylvania railroad tunnel, Baltimore, to Truscon Steel Co., Youngstown, O.

200 tons, gas holder, Baltimore, to Bartlett-Hayward Co., Baltimore.

200 tons, tunnel liner plates, Pennsylvania railroad, Baltimore, to Truscon Steel Co., Youngstown, O.

200 tons for government project at Dallas, Tex., to King Boiler Works, Galveston.

Unstated, water tank contracts placed in South; 250,000-gallon, Radford, Va., to Chicago Bridge & Iron Works, Chicago; 100,000-gallon tank on 100-foot tower, Brownsville, Tex., to Mosher Steel Co., Houston, Tex.; tank and tower, Jamestown, Tenn., to R. D. Cole Mfg. Co., Newnan, Ga., $8744; tank and tower, Wingo, Ky., to Steel Construction Co., Birmingham, Ala., $6123; tank and tower, Deepwater, Mo., to Chicago Bridge Iron Works, Chicago.

Unstated, 15 truck tanks and other work for various interests, to Beall Pipe & Tank Co., Portland, Oreg.

Unstated tonnage, steel water storage tank, veterans' hospital, Hot Springs, S. Dak., to Pittsburgh-Des Moines Steel Co., Pittsburgh, $6158; bids March 12.

Contracts Pending

3500 tons, 32-inch welded pipe, metropolitan water district, Los Angeles, specification 1641; Western Pipe & Steel Co., Los Angeles, low.

Unstated tonnage, one 60-foot steel whirler derrick hull, United States engineer, Memphis, Tenn.; bids April 19.

Unstated tonnage, 245-foot steel house boats, department of agriculture; Charles Hegewald Corp. New Albany, Ind., low; bids March 26.

Transportation

Track Material Prices, Page 53

Western railroads have furnished practically the only steel rail buying recently, which is almost the only activity in the transportation field. Placing of 24,500 tons of rails by roads west of Chicago includes 19,500 tons by the Union Pacific, 3000 tons by the Western Pacific and 2000 tons by the Kansas City Southern. Eastern roads are delaying further rail buying until the situation clears in regard to finances. The Erie is asking tenders for an indefinite tonnage.

Current routine steel needs for repairs and maintenance are being covered in practically normal volume, to care for necessities.

Railroads are not buying cars, none being sold during March, and at present intracity transportation lines are taking practically all that are bought. The Erie has awarded 55 milk car bodies. Brooklyn-Manhattan Transit has placed 25 five-car trains, the street railway at Providence, R. I., has bought 31 trolley coaches and a San Francisco street railway eight of the same type.

Comparisons of freight car sales for four years follows:

	1935	1934	1933	1932
Jan.	24	152	3	159
Feb.	806	19,725	0	35
March	0	30	5	105
3 Mo.	830	19,907	8	299
April		800	50	0
May		717	8	60
June		1,835	500	0
July		19	306	25
Aug.		105	202	5
Sept.		7	23	1,298
Oct.		75	514	0
Nov.		254	533	2
Dec.		110	316	50
Total		23,829	2,460	1,739

Board of Transportation, New York, will revive its inquiry for 500 subway cars for the Eighth avenue subway in June. Amtorg Trading Co., recently in the market for locomotives for Russia, will buy probably 20.

Car Orders Placed

Brooklyn-Manhattan Transit, New York. 25 articulated five-car units, 15 to Pullman-Standard Car Mfg. Co., Chicago, and 10 to St. Louis Car Co., St. Louis.

Erie, 55 milk car bodies, to Greenville Steel Car Co., Greenville, Pa.

Market Street Railways, San Francisco, eight trolley coaches, to J. G. Brill Co., Philadalphia.

United Electric Railways, Providence, R. I., 18 trolley coaches, to Pullman-Standard Car Mfg. Co., Chicago; 13 to J. G. Brill Co., Philadelphia.

Locomotives Placed

Bureau of supplies and accounts, navy department, two switching locomotives, Hingham, Mass., and Portsmouth, N. H., to American Locomotive Co., New York.

Rail Orders Placed

Kansas City Southern, 2000 tons to Illinois Steel Co., Chicago.

Union Pacific, 19,500 tons, to Colorado Fuel & Iron Co., Denver, Illinois Steel Co., Chicago, and Inland Steel Co., Chicago.

Western Pacific, 3000 tons to Colorado Fuel & Iron Co., Denver.

Car Orders Pending

United States engineer, Rock Island, Ill., one flat car, Atlas Car & Mfg. Co., Cleveland, low.

Busses Placed

White Motor Co., Cleveland: Thirty-five city coaches, in addition to 15 previously reported, for North Shore Bus Co. Inc., Flushing, L. I.; three city coaches for Consolidated Bus Lines, Allwood, N. J.; nine city coaches for Highway King Coach Lines Ltd., Hamilton, Ont.; two city coaches for Old Colony Coach Lines Inc., Boston; three city coaches for Vermont Transit Co., Burlington, Vt.; 16 Indiana coaches for Rocky Mountain Motor Co., Denver; three city coaches for Newburgh Bus Co., Newburgh, N. Y.; five city coaches for Virginia Electric & Power Co., Richmond, Va.

Sheets

Sheet Prices, Page 52

Pittsburgh—For the third consecutive week, automotive buying of sheets has declined, leaving the market supported chiefly by orders from miscellaneous groups. Although jobbing mills showed a 5-point increase last week to 55 per cent, black sheet production was down to 70 per cent, and full-finished operations were off a few points to just above 75 per cent.

Cleveland — While no further reduction has developed in sheet mill operations in this district, now 75 per cent, automobile manufacturers are more conservative with new commitments. Ford and Chrysler assembly schedules this month are down moderately to 135,000 and 70,000, respectively, but Chevrolet has advanced its tentative schedule of 118,000 to 132,000, and has set 134,000 as its goal for May. Specifications are being released in good volume for this month. Business from makers of household utilities is attractive, but in lighter volume than last month.

Chicago—Sheet demand is slightly more active among consumers other than the automotive industry. Motorcar demand is quiet compared with the rushed activity earlier in the year. Sheet mill operations average 70 to 80 per cent.

Boston — Warehouse distributors of sheets are taking light tonnages. Demand for galvanized is slow. Small tank requirements have declined. Fabricators of household goods are specifying regularly but in less than car lots.

New York — Sheet tonnage continues to move fairly well, particularly to manufacturers of electrical household equipment. Some lift to business may develop due to the impending increase in freight rates of 2 cents per 100 pounds.

The American Iron and Steel institute has declined to accept, on a technicality, price advances of $2 to $8 a ton on sheet wasters and seconds filed April 1, but mills claim an increase on these grades does not constitute a violation of the code, and are quoting the higher prices.

Philadelphia — Sheet business is spotty, although several fair tonnages are being figured. One is for a $1,000,000 ventilator installation for a government building in Washington on which the York Ice Machinery Corp., York, Pa., has the fabricating contract, and another involves 200 to 225 tons of pickled sheets for 1936 license tags for Virginia, bids April 16. The impending freight rate increase will add 2 cents per 100 pounds to delivered prices here. here.

Washington — Award of miscellaneous sheets for the navy, schedule 4057, delivery at various yards to three mills is announced. Eastern Rolling Mills Co., Baltimore, and Superior Sheet Steel Co., Canton, O., about evenly divided 1200 tons. Apollo Steel Co., Apollo, Pa., booked 207 tons of black, cold-rolled, box-annealed, pickled and oiled sheets, 0.0246-inch thick, for Mare Island, Calif., at $16,758.88, delivered.

Buffalo — Sheet mill schedules here are steady at 70 to 75 per cent. Order books still provide a good backlog.

Cincinnati — District sheet mills have readjusted schedules downward to about 70 per cent. New business and specifications are below levels of last quarter.

St. Louis—While specifications on sheets are holding up, the volume of new business booked for second quarter is disappointing. Galvanized material is making the best showing at present.

Birmingham, Ala. — Activity at sheet mills in this district is uninterrupted with strong miscellaneous demand.

Pipe

Pipe Prices, Page 53

Pittsburgh — Operations for the pipe industry have shown a slight gain the past week to about 30 per cent. However, on some specialty items such as mechanical tubing for the automotive trade, operations are nearer 40 per cent. Miscellaneous small lots of line pipe are being used by Magnolia Petroleum Corp., a subsidiary of Socony-Vacuum Oil Co. Inc., New York, for reconditioning approximately 700 miles of oil pipe lines in Texas.

Cleveland—Several small lots of cast pipe were placed here during the week, including 200 tons for Cuyahoga Falls, O. More inquiries are developing from municipal projects.

Chicago—Cast pipe orders and inquiries are few and new business is slow. Releases against old contracts are more numerous, however, and production is expected to improve during coming weeks.

Boston—Cast pipe inquiry is heavier, but still below normal for this season. Utilities are buying a minimum of requirements. Merchant steel pipe buying is steady, but in limited volume. Several cars of steel pipe are required for the heating contract on new buildings for the veterans' hospital, Tougas, Me., general contractor Virginia Engineering Co., Newport News, Va.

New York—Cast pipe inquiry has dropped to a low point for this season following the purchase of 5000 tons for New York, bought by contractors. Prices on some volume placed recently have been low.

Birmingham, Ala. — Demand remains unchanged, though awards are in small tonnages with few exception. Shops are operating around 60 per cent and backlogs, with additional business in sight, insure this rate through the quarter and probably longer.

San Francisco—Demand for cast pipe has shown little improvement during the past few weeks and bookings for the first quarter aggregated only 6143 tons. Over 5000 tons for the Hetch Hetchy bay-crossing pipeline is by the boards as the city of San Francisco has purchased welded steel pipe.

Seattle — Business is developing slowly, no important tonnages being up for figures. Requirements in this territory are heavy but municipalities are awaiting federal financial aid.

Cast Pipe Placed

200 tons, Cuyahoga Falls, O., to James B. Clow & Sons, Chicago.

162 tons, 12 to 16-inch, class 150, Beverly Hills, Calif., to unnamed interest.

150 tons, Medusa Cement Co., Manitowoc, Wis., to James B. Clow & Sons, Chicago.

100 tons, 20-inch, disposal plant, Burlingame, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, state hospital, Camarillo, Calif., to unnamed interest.

Cast Pipe Pending

5000 tons, bay-crossing pipe line, Hetch Hetchy project, San Francisco; placed on basis of welded steel pipe.

4000 tons, 20-inch and under, Palmyra, N. Y., bids April 16; alternates on welded steel, wrought or ingot iron.

273 tons, 4 and 6-inch, class 150, Enterprise, Utah; bids in.

185 tons, 8-inch and under, Bland, Mo.; bids April 12; also 50,000-gallon steel tank.

150 tons, 16-inch, Fernald state school, Waverly, Mass.

270 tons, 6 and 8-inch, Medford, Mass.; bids in.

118 tons, Tremonton, Utah; bids in.

Unstated tonnage, 1824 feet of 20-inch, Madison, Wis.; bids in.

Unstated tonnage, new waterworks, Princeton, Wis.; bids April 18.

Unstated tonnage, 1000 feet of 24-inch, sewer work, Aurora, Ill.; Santucci Construction Co., Niles Center, Ill., general contractor.

Handy and How

SO says the "hard boiled" foreman who knows "a thing or two" about saving shop work and assembly time in fabricating such items as die backing plates, stripper plates and bed plates.

He is solidly "sold" on B & L Extra Wide Flats for a score of uses. They take the guesswork out of important jobs, because of their uniformity in straightness, flatness and thickness, which eliminates a lot of time so often wasted in "trueing up" the work.

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Shapes

Structural Shape Prices, Page 52

Chicago—Structural awards total only 2000 tons, practically all of which is for state bridges. Addison Miller Inc., St. Paul, is low for the general contract for the Ft. Peck, Mont., dam spillway, involving 3500 tons of rolled structural material and 1600 tons of forgings and miscellaneous parts.

Pittsburgh — Both inquiry and awards have dropped to the lowest point of the year. Although Weirton Steel Co. will furnish most of the plates and structurals required for building the 10,000-ton Great Lakes Steel Corp. mill building at Detroit, the fabricator's contract has not yet been awarded. Plain structurals are firm at 1.80c, Pittsburgh.

Cleveland—Awards and inquiries are limited to small lots. Revised plans for the Western Automatic Machine Screw Co.'s building, Elyria, O., call for 525 tons, instead of 225. Continental Can Co., Elwood, Ind., is inquiring for 330 tons for a building. Lintels for the Cleveland federal housing project will require 250 tons, bids at Washington, April 23.

New York—Structural inquiry is light, schools and bridges accounting for the bulk of unplaced volume. Practically all the latter are under 500 tons each.

Structural material is being used for an increasing number of small apartment buildings, taking light tonnages, although the volume is impressive. Six thousand tons of used shapes from World fair buildings, Chicago, have been purchased by a district fabricator for distribution later.

Philadelphia — Apart from the award of 385 tons for a plant addition for the Du Pont interests at Carney's Point, Pa., the market is quiet. The impending freight rate increase will raise the delivered price from 2.00½c, Philadelphia, to 2.01c.

San Francisco—A crossing over the Southern Pacific and Key Route tracks, in Oakland, Calif., in connection with the San Francisco-Oakland bay bridge, will require 2250 tons, contractor bids going in April 7. Pacific Coast Steel Corp. took 400 tons for the Marina junior high school, San Francisco. Awards during the first quarter totaled 17,319 tons, compared with 25,726 tons in the same period a year ago.

Seattle — Fabricating plants view the situation more favorably as small jobs in greater volume indicate industrial activity. Mason, Walsh, Atkingson, Kier Co., Seattle, general contractors for the Coulee, Wash., dam, are considering bids for a mixing plant requiring 300 to 500 tons of shapes. A state undercrossing, at Tenino, Wash., bids April 9, will require 140 tons.

Boston—Awards are light, including about 400 tons for schools at Andover, Mass., and Cranston, R. I.

Shape Contracts Placed

1350 tons, public school No. 43, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.; through George A. Driscoll Co., Brooklyn, N. Y.

500 tons, state bridges, Iowa; 330 tons to Pittsburgh-Des Moines Steel Co.,

Shape Awards Compared

	Tons
Week ended April 6	7,140
Week ended March 30	9,140
Week ended March 23	54,120
This week in 1934	6,021
Weekly average, 1934	16,284
Weekly average, 1935	14,945
Weekly average, March	20,670
Total to date, 1934	248,905
Total to date, 1935	209,239

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   Tensile Strength (Lb. per sq. in.) 90,000 min.
   Elongation (% in 2 in.) . . . . . 20 min.
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   Excellent (no treatment required to prevent brittleness.)
3. CORROSION RESISTANCE . . .
   Superior to all ordinary steels.
4. FABRICATION . . .
   Cold Bends 180° flat upon itself.

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Pittsburgh; 90 tons to Vierling Steel Works, Chicago; 80 tons to Des Moines Steel Co., Des Moines, Iowa.

460 tons, beam spans, Clinch river bridge, Tennessee valley authority, New Tazewell, Tenn., to Nashville Bridge Co., Nashville, Tenn. This is in addition to 1200 tons for same project to the same fabricator reported last week in STEEL.

445 tons, state highway bridge, North river, Lexington, Va., to Virginia Bridge & Iron Co., Roanoke, Va., Austin Construction Co., South Boston, Va., general contractor.

400 tons, Marina junior high school, San Francisco, to Pacific Coast Steel Corp., San Francisco.

385 tons, plant addition for the Du Pont interests, Carney's Point, Pa., to the Belmont Iron Works, Eddystone, Pa.

325 tons, state bridges, Arkansas; 225 tons to Virginia Bridge & Iron Co., Roanoke, Va., 100 tons divided among Arkansas Foundry Co., Little Rock, Ark., Ft. Smith Structural Steel Co., Ft. Smith, Ark., and Vincennes Bridge Co., Vincennes, Ind.

350 tons, public school No. 225, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

300 tons, piling for Rye Patch, Nev., specification 20383-A, to unnamed interest.

275 tons, cable supports, specification 609, Boulder dam, Boulder City, Nev., to unnamed interest.

255 tons, junior high school, Andover, Mass., to New England Structural Co., Everett, Mass.

250 tons, bridge, Crowell, Tex., to North Texas Iron & Steel Co., Ft. Worth, Tex.

250 tons, school, Somerville, Mass., to New England Structural Steel Co., Everett, Mass.; through Matthew Cummings Co., Boston.

250 tons, canning factory, Cedarsburg, Wis., to Worden-Allen Co., Milwaukee.

215 tons, state highway bridge NRH RC 3603 Olcott county line, Youngstown-Olcott, Niagara county, New York, to R. S. McMannus Structural Steel Co., Buffalo; McLain Construction Corp., Buffalo, general contractor.

190 tons, school, Monticello, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, state bridges, Missouri, to St. Louis Structural Steel Co., East St. Louis, Ill.

150 tons, state highway bridge, Birds, Ill., to R. C. Mahon Co., Detroit.

130 tons, warehouse, Keystone Grocery, Reading, Pa., to Reading Metal-Craft Co., Reading, Pa.

125 tons, second unit, Amalagmated Sugar Co. plant, Clarksburg, Calif., to Ogden Iron Works, Ogden, Utah.

120 tons, bar joists and reinforcing, grade and high school, Tupper Lake, N. Y., to Concrete Steel Co., New York; G. D. Campbell Co., Poughkeepsie, N. Y., general contractor.

120 tons, warehouse, Keystone Grocery Co., Reading, Pa., to the Reading Metalcraft Co., that city.

110 tons, cement plant, Osborn, O., to Oregonia Bridge Co., Lebanon, O.

110 tons, highway bridge in Pike county, Missouri, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

100 tons, shapes and bars, postoffice, Waltham, Mass., to Lehigh Structural Steel Co., Allentown, Pa., and Concrete Steel Co., New York; Leighton, Mitchell Co., Boston, general contractor.

100 tons, warehouse at Jefferson barracks, St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

100 tons, or more, addition to Genesee Brewing Co.'s plant, Rochester, N. Y., to F. L. Heughes Co., Rochester.

Shape Contracts Pending

3500 tons, rolled steel, also 1600 tons forgings and miscellaneous parts, Ft. Peck dam spillway, Wiota, Mont.; Addison Miller Inc. low for general contract.

2250 tons, Southern Pacific and Key Route crossing of San Francisco-Oakland bay bridge, Oakland, Calif.; bids April 7.

1325 tons, state bridges, Texas.

1130 tons, four Illionis state bridges; bids April 9.

550 tons, cableway towers, Ft. Peck dam, Wiota, Mont.

525 tons, building, Western Automatic Machine Screw Co., Elyria, O., plans revised from 225 tons.

500 tons, state grade elimination, Laurelton parkway, Queens, N. Y.; Wilson & English Co., New York, low.

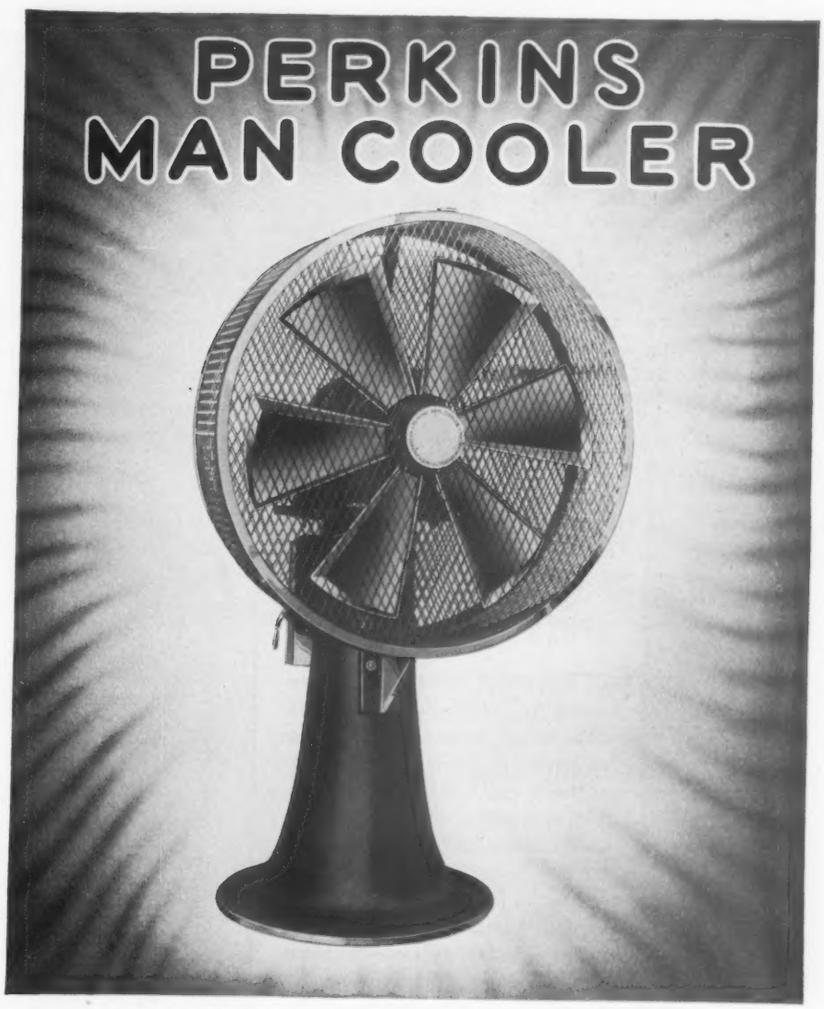
427 tons, state bridge, Mantau Creek, Paulsboro, N. J.; Gray Construction Co., Morristown, N. J., low. Project also takes 47 tons of machinery and 51 tons of reinforcing bars.

330 tons, building, Continental Can Co., Elwood, Ind.

300 to 500 tons, mixing plant, Coulee, Wash., dam project; bids in.

300 tons, plant building for Upjohn Co., Kalamazoo, Mich.

250 tons, lintels, Cleveland federal hous-



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ENGINEERS AND MANUFACTURERS

ing project; bids at Washington April 23.

225 tons, buildings, Bronx terminal market, department of markets, New York; bids in.

156 tons, high school, Cranston, R. I.; Central Engineering & Construction Co., Pawtucket, R. I., general contractor; also takes 84 tons of reinforcing bars.

150 tons, hospital, New Brunswick, N. J.; Breen Iron Works, Newark, N. J., low.

140 tons, state overhead crossing, Tenino, Wash.; bids April 9.

135 tons, state overhead crossing, Ellensburg, Wash.; bids in.

130 tons, Enterprise department store, Brockton, Mass.; C. T. Crowell Co., Brockton, general contractor.

130 tons, pumping station, Washington, for District of Columbia.

125 tons, state highway projects, Mississippi, bids April 16; also 85 tons reinforcing steel.

125 tons, high school, Abington, Mass.; bids soon.

123 tons, state bridge, Roanoke county, Virginia; bids April 11.

118 tons, state crossing in Thurston county, Washington; bids April 9.

100 tons or more, state bridge, three-span overpass over Rutland railroad, United States route 7, Dorset, Vt.; B. A. Barton Construction Co. Inc., Vergennes, Vt., general contractor.

For imparting a fine finish on molds, bodies and caps for line type composing machines, one large builder laps the work on a rotary wheel with a mixture of Turkish emery, 6-F, and naphtha.

Reinforcing

Reinforcing Bar Prices, Page 53

Chicago—Low bidder on the general contract for the Ft. Peck, Mont., dam spillway, involving 11,000 tons, has been announced. Bids have been opened on 600 tons for additional construction at the Stickney, Ill., sewage disposal plant, the main section of which involves 6500 tons. This was erroneously reported a week ago as 650 tons. Awards include 900 tons for the Hammond, Ind., filter plant, while a similar tonnage will be required for the Detroit parcel post building, general contract for which has been placed.

Boston—Pending requirements for miscellaneous public works projects in Connecticut are heavier and awards include 150 tons for a college building at Hartford. Educational buildings, Kingston and Cranston, R. I., will take close to 170 tons.

Pittsburgh—New billet steel reinforcing bars are in better demand for repair jobs. For grade crossing work on Staten Island, N. Y., the Baltimore & Ohio railroad engineers have delayed to an indefinite time the opening of bids on work which will require up to 4000 tons of new billet steel bars.

Cleveland—Low bid for the general contract for the Senecaville, O., dam in the Muskingum conservancy district, taking about 150 tons of reinforcing bars, pipe and shapes, is $329,280, compared with $535,000, the next lowest bid. Few jobs in this district have shown such a wide divergence in bids. The general market is quiet.

New York — Pending tonnage in this district totals approximately 1000 tons. Fabricators are figuring on unit No. 2 sewage treatment plant, Washington, taking an estimated 1000 tons, bids April 22.

Philadelphia — Despite improved weather conditions, tonnage is coming out slowly. The trade looks for the increase in freight rates to become effective around the latter part of this month. This will add 2 cents per 100 pounds to the delivered price of bars here, and the new figure on billet steel bars, cut lengths, will be 2.36c, Philadelphia, per pound.

San Francisco — This year 35,046 tons of concrete bars have been booked, compared with only 23,689 tons in the corresponding period in 1934. Truscon Steel Co. was awarded 269 tons for a school in Los Angeles. For a crossing in connection with the San Francisco-Oakland bay bridge, over the Southern Pacific and Key Route tracks in Oakland, 1750 tons will be required, bids April 7.

Seattle — Seattle has placed 180 tons for a seawall project with Northwest Steel Rolling Mills and Pacific Coast Steel Corp., Seattle, equally divided. The latter company also has booked a small tonnage for the Colville, Wash., Indian reservation hospital. Several small jobs involving less than 100 tons each have been awarded the two local plants. While large projects are lacking, an increasing tonnage in small lots is

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Concrete Awards Compared

	Tons
Week ended April 6	2,059
Week ended March 30	6,505
Week ended March 23	2,891
This week in 1934	5,592
Weekly average, 1934	4,084
Weekly average, 1935	4,824
Weekly average, March	5,506
Total to date, 1934	71,336
Total to date, 1935	67,538

developing. The department of agriculture, Washington, is considering bids for two Montana wild waterfowl refuges, requiring considerable steel.

Reinforcing Steel Awards

900 tons, filter plant, Hammond, Ind., to W. J. Holliday & Co., Hammond, Ind.
269 tons, Robert Louis Stevenson school, Los Angeles, to Truscon Steel Co., Los Angeles.
180 tons, Seattle seawall project, to Pacific Coast Steel Corp. and Northwest Steel Rolling Mills, Seattle.
150 tons, building, Trinity college, Hartford, Conn., to Truscon Steel Co., Youngstown, O.; A. F. Peaslee Inc., Hartford, Conn., general contractor.
152 tons, school, Newport Beach, Calif., to Graham Bros., Los Angeles.
106 tons, lemon packing plant, San Fernando, Calif., to Truscon Steel Co., Los Angeles.
102 tons, alterations to David Starr Jordan school, Los Angeles, to Soule Steel Co., Los Angeles.
100 tons, repair of school, Altedena, Calif., to Hammond Lumber Co., Los Angeles.
100 tons, two buildings for junior college, Pasadena, Calif., to unnamed interest.

Reinforcing Steel Pending

11,000 tons, Ft. Peck dam spillway, Wiota, Mont.; Addison Miller Inc., St. Paul, low for general contract.
1750 tons, Southern Pacific and Key Route crossing of San Francisco-Oakland bay bridge, Oakland, Calif.; bids April 7.
900 tons, parcel post building, Detroit; Joseph A. Holpuch Co., Chicago, awarded general contract.
750 tons, Mohawk dam, Warsaw, O., low bid to United States engineer, Zanesville, O., by George M. Brewster & Son, Begota, N. J.
600 tons, pumping and blower building, sewage disposal plant, Stickney, Ill., for Chicago sanitary district; M. J. Boyle & Co., Chicago, low for general contract.
500 tons, caisson core wall, Quibban reservoir towns of Belchertown, Enfield and Ware, Mass., for metropolitan district water supply commission, Boston; bids May 7.
400 tons, Hall of Records, Fresno, Calif.; general contract awarded William Spivock, San Francisco.
300 tons, buildings, Bronx terminal market, department of markets, New York; Turner Construction Co., New York, low.
289 tons, for pipe line, Eureka, Calif.; bids soon.
285 tons, highways and bridges, Natchitoches parish, Louisiana; bids in April 4.
285 tons, Folger avenue subway, Berkeley, Calif.; bids soon.
200 tons, highway, route S-24, section 2, Union to Springfield, Union county, New Jersey; Union Building & Construction Corp., Passaic, N. J., low.
150 tons, reinforcing bars, structural shapes and pipe, Senecaville, O., dam, Muskingum conservancy district; Mercier & Co., Detroit, low for general contract.
145 tons, hospital building, New Brunswick, N. J.; Frank Briscoe Co., general contractor.
117 tons, Patrick Henry school, San Francisco; Concrete Engineering Co., San Francisco, low.
100 tons, highways, Bossier and Lafourche parishes, Louisiana; bids April 10.
100 tons, plant building, Continental Can Co., Elwood, Ind.

Semifinished

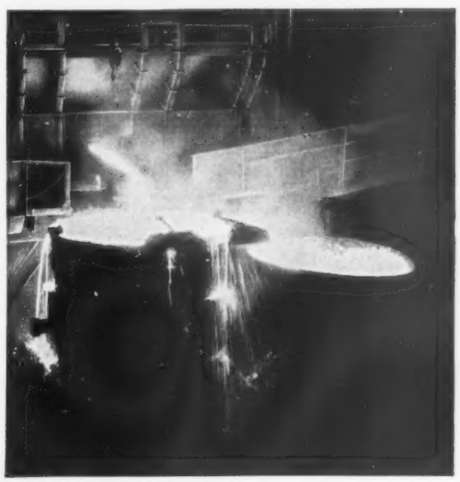
Semifinished Prices, Page 53

While forward buying of billets, wire rods, and skelp is light, demand for semifinished steel from tin plate and sheet industries is steady. The delivered Philadelphia price on billets will be increased by the new freight rate schedule, to become effective about April 15, approximately 37 cents a ton, to $32.67. This is on the basis of a 7 per cent increase in the existing freight rate from Pittsburgh of $5.30.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 53

An improvement in bolt, nut and rivet specifications has occurred the first week of April compared with



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the same time a month ago, according to producers in the Pittsburgh district. There is a slightly heavier volume of buying for railroad repair work, this improvement featuring not only bolts and nuts, but large and small rivets. On business not previously under contract, the market is quoted 70-10-5 off on bolts and nuts, and 2.90c, Pittsburgh or Cleveland, 3.00c, Chicago, on large rivets.

At Chicago and Cleveland new business is light with small test of the lower prices.

Strip Steel

Strip Prices, Page 53

Pittsburgh—Operations in the hot-rolled strip steel industry receded slightly last week to about 47 per cent of capacity, and in cold-rolled strip to around 58 per cent. Automotive buying is expected to develop through this month for May shipment. Meanwhile, several mid-western strip buyers, who fabricate steel lockers, chairs, and small miscellaneous stampings, have been active.

Cleveland — New orders and specifications for strip steel from automobile and parts manufacturers showed a further decline for the week, and mill schedules here and in nearby districts were reduced moderately. Some improvement in shipments is expected to result from the impending advance in railroad freight rates.

Chicago—Strip steel demand continues to lag under the influence of lessened automotive buying, with shipments also affected adversely. Purchasing by miscellaneous strip consumers also is less active in both hot and cold-rolled material.

Boston—Cold strip backlogs are light and most mills are operating on current bookings. Such orders, well spread, but not individually large, are holding better than expected

New York—Automobile accessory manufacturers continue the most active consumers of cold-finished strip, with the market otherwise featureless. An increase of 2 cents per 100 pounds in the delivered price of narrow strip steel here will result from the proposed advance in freight rates.

Philadelphia — Narrow strip tonnage is moving slowly, although the proposed increase in freight rates may lead to some improvement. The increase in the Pittsburgh rate to Philadelphia will be 2 cents per 100 pounds, which will bring the delivered price on hot strip to 2.16c, and on cold strip to 2.91c.

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Wire

Wire Prices, Page 53

Pittsburgh — Plain manufacturing wire shipments have increased slightly. Mill prices on wire products are quoted unchanged. There is no change in the cold-heading quality wire price which in many cases is competitive with cold-drawn bars. Last week Pittsburgh engineers took bids on 1590 feet of copper-bearing steel wire for locks No. 4 and No. 5 on the Monongahela river.

Cleveland—Wire tonnage booked here in the first quarter was 40 per cent larger than in the period last year. Currently, demand is slower, due in part to labor difficulties at some manufacturing plants. From jobbers and the agricultural districts orders are more plentiful for plain wire and fencing.

Chicago—Wire demand continues fairly active despite a decrease in shipments to the automotive industry. Merchant products gradually are moving at a more active rate.

Boston—Recent slight decline in demand for wire has halted with most mills and some note a slight improvement. Orders for wire entering into manufactured goods have held and there has been a slight gain in merchant wire specifications.

Memphis, Tenn.—Bids will be opened April 8 on 450 tons, 7/16-inch bright ungalvanized steel strand, for the United States engineer here, material to be delivered at Bridge Junction, Ark. This is schedule 35-315F.

Tin Plate

Tin Plate Prices, Page 52

Pittsburgh—Canmakers tin plate specifications for May shipment continue sufficiently high to engage mills over 85 per cent. The market is steady at $5.25, Pittsburgh, per base box for standard tin plate.

Cold Finished

Cold Finished Prices, Page 53

Pittsburgh—After deciding upon a firm price policy, regardless of a small Detroit producer's $3 a ton reduction on cold-finished steel bars ten days ago, larger producers took similar action at all basing points. The new prices become effective with shipments April 11, as follows: 1.95c, Pittsburgh; 2.00c, Cleveland or Gary, Ind.; 2.05c, Buffalo; 2.15c, Detroit,

and 2.20c, eastern Michigan. Last week cold-finished steel bar buying was practically at a standstill. Even some buyers who had been insistent for deliveries issued holdups.

Pig Iron

Pig Iron Prices, Page 54

Cleveland—Pig iron shipments are expected to be stimulated by the interstate commerce commission's order permitting railroads to advance freight rates, with the carriers to set the date. Producers estimate the advances allowed by the commission will raise their costs 40 to 50 cents a ton. The increase on iron ore, applied only in the upper lakes, is to be 10 cents per net ton, or 11.2 cents per gross ton, equivalent to about 20 cents for a ton of pig iron. On coal and coke there is a sliding scale. Freight rates up to 75 cents a ton may be raised a maximum of 3 cents; 75 cents to $1, five cents; $1 to $1.50, fifteen cents. As most of the producers are in this latter range, this would add about 20 cents to their freight on fuel used in making a ton of pig iron. Pig iron prices cannot be advanced this quarter. New commitments have declined, a lake merchant furnace interest booking only 3000 tons.

Pittsburgh—Excepting a few large foundries in this district occupied mainly on new steel mill equipment contracts, merchant pig iron users are buying infrequently and at a greatly reduced volume. Jobbing foundries and such district users as radiator manufacturers are making pig iron commitments in scarcely more than carload lots.

Chicago — Pig iron business and shipments are holding well and April is expected to match last month in deliveries. As yet the proposed increases in freight rates are not reflected in anticipatory shipments.

Boston — While small orders for pig iron are more frequent, aggregate sales in this district continue light with substantial inquiry lacking. Imports in the Boston customs district during the first quarter totaled 2020 tons, 1298 tons of Dutch and 722 tons of Indian.

New York—Pig iron business still lags. For Brooklyn, N. Y., foundries the increase in freight rates will amount to about 16 cents per ton, and for Newark, N. J., 10 cents.

Philadelphia — Shipments may be mildly stimulated by proposed freight rate increase. This rate increase will amount to 7 per cent of the existing rate up to a maximum of 2 cents per 100 pounds. The Swedeland, Pa., producer blew in a furnace late last week.

Buffalo — The second Rogers Brown furnace is now in full production, doubling the current output of merchant iron. A long run is scheduled for this stack. First steamers of the steelworks fleets left here this week and early arrivals of coal are expected, 30 days in advance of the usual opening of local navigation.

Cincinnati—Shipments of pig iron in this district are almost as heavy as the average for March and some of the principal melters have quietly entered second quarter contracts for tonnages equal to those of the first quarter. Melters are buying for early needs.

St. Louis—Shipments of pig iron in March were the heaviest for that month since 1930. Demand centers chiefly in foundry grades.

Birmingham, Ala.—The market is steady with production active. Demands are mainly of spot nature.

Toronto, Ont. — Sustained business is noted in the merchant pig iron markets. The daily melt is holding around 40 per cent.

Scrap

Scrap Prices, Page 55

Pittsburgh—In undergoing a 50-cent per ton decline last week leaving No. 1 heavy melting steel quoted $11.50 to $12 in this district, the scrap market lost its temporary gain of the week previous. One mill buyer averaged a small tonnage of No. 1 steel last week at $11.75 a ton, delivered in this district. The Baltimore & Ohio railroad sold a small tonnage of heavy melting steel for local delivery at around $11.30 a ton, its local lines, or close to $12, delivered to a district mill.

Cleveland—Though steel and iron scrap melters hestitate about buying, in view of comfortable reserves, a feeling of firmness is increasing. Railroad lists currently offered are light and in several cases all bids were refused. Prices do not yet reflect the better sentiment and are unchanged.

Chicago — Scrap prices continue easy and lower quotations are expected to prevail on subsequent mill buying. Steelworks have been out of the market recently and only small purchases are expected this month. While railroads' offerings are heavier, dealers' scrap is appearing in only small lots.

Boston—Light buying operates against recovery in scrap prices and dealers' quotations on most grades are barely maintained. With export

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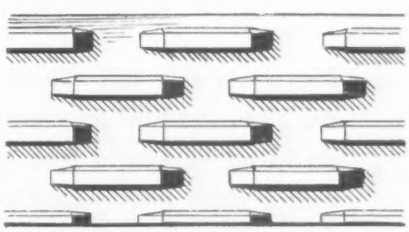

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volume lower and dealers paying $8.50 to $7.50, dock, for heavy melting steel grades, the domestic demand is giving little support.

New York—While foreign buyers are buying less scrap, dealers are covering contracts, such activity being practically the sole steadying influence on a still unsettled market. For heavy melting steel scrap dealers are paying $9 and $7.50, barge.

Philadelphia — A mixed situation prevails in scrap, although in the main the market is firm. No. 2 heavy melting steel is up 25 cents to a spread of $8.75 to $9.25, delivered consuming point. This increase in No. 2 steel reflects particularly an advance on material for Phoenixville, Pa. Strength in this grade is also indicated in the Baltimore district, where the Sparrows Point consumer has closed on a round tonnage at $10, delivered, an increase of 50 cents. No. 1 steel in the eastern Pennsylvania district is unchanged at $10 to $10.50, delivered. Stove plate is off 50 cents to $8 to $8.50.

Buffalo — The scrap market has settled to $10.50 offered for No. 1 heavy melting steel and $9 for No. 2 and substitutes. Not much buying is being done at these levels, and shipments on contracts are nearing completion. Dealers claim scrap bought for shipment into the district by water will cost consumers at least $1 more than their present local bid and that comparatively small tonnage of this sort has been contracted.

Detroit—Except for a 50-cent reduction in machine shop turnings, iron and steel scrap prices appear to have leveled off. While automotive offerings continue large, they are not quite so heavy as several weeks ago. Ford is storing hydraulic compressed bundles, having put 15,000 to 20,000 tons on the ground in the past ten days. A Cleveland steelworks has been taking in a large tonnage of scrap, reported to be on a reciprocal basis with a large automotive interest.

Cincinnati—Continued absence of mill buying results in softness of iron and steel scrap, quotations remaining unchanged but nominal. No. 2 steel is especially weak, with some embargoes effective on this grade.

St. Louis—Purchasing of iron and steel scrap continues low, with the result that the prices have declined further.

Birmingham, Ala. — In sympathy with weakness in other centers prices of steel and iron scrap in this district have declined 25 to 50 cents per ton. Offers to buy at that decline were accepted in several instances.

Seattle — There has been no change this week in the scrap export situation. Offers from the Orient, due largely to weakness of exchange, are uninteresting. Exporters are trying to hold the market at present levels, approximately $9.25 for No. 1 melting and $10.75 for rails.

Toronto, Ont.—Improvement is appearing in Canadian iron and steel scrap markets. Montreal dealers report improvement in demand for steel grades with some inquiries from Britain.

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Warehouse

Warehouse Prices, Page 56

Pittsburgh—It is expected that with effect of the $3 a ton lower mill price on cold-finished steel bars that jobbers will revise the present 3.45c quotation for shipment out of stock locally. Other warehouse prices are without change here and fairly steady.

Cleveland—Cold-finished steel bar price has been reduced $3 a ton to 3.35c for local delivery and 3.25c for outside shipment. Other prices are steady. Strikes in this territory are interfering with business, orders and tonnage being down moderately. March developed the same volume as did the month last year.

Chicago — Warehouse sales are fairly steady but a seasonal recession is regarded as not unlikely this month following fairly good activity in March. Prices are unchanged with a decrease on cold-finished bars in prospect.

New York—Improvement in warehouse volume has gained momentum since the first of the month, buying being well distributed.

Philadelphia — While there has been little change since the beginning of the month, the daily rate of business in March in the local warehouse market was slightly higher than in February, for most jobbers.

Detroit—While automotive manufacturers have considerably curtailed their demands for iron and steel from mills, their requirements from warehouses have been sustained at the average of recent weeks. Prices are unchanged.

Cincinnati — Jobbers' sales for March disclosed an upturn which, however, has not been extended so far into this month.

St. Louis—Some gain during the last ten days of March in warehouse sales brought the total for the month slightly above that of February. Compared with a year ago, March sales showed a decided improvement.

Seattle — Warehouse buying is well maintained with all items in good demand. March volume exceeded February, both months being well ahead of 1934.

Iron Ore

Iron Ore Prices, Page 55

Cleveland—Lake Superior iron ore producers are considering the effect the emergency freight rate advance authorized by the interstate commerce commission will have on their costs and market. The maximum increase which the railroads will be permitted to make is 10 cents per

net ton, or 11.2 cents per gross ton on which basis iron ore is sold. It is limited to hauls from mines to upper lake ports.

As producers quote prices delivered at lower lake ports they will have to pay the advance, unless it is decided to raise ore prices. Consumers probably will begin to issue inquiries.

From Jan. 4, 1932, to Sept. 30, 1933, an emergency freight rate advance amounting to 6.7 cents per gross ton was in effect. It is permissible to divide the additional revenue between upper and lower lake iron ore carriers, as was done in that "emergency".

Blast furnaces have in stock 27,000,000 tons of ore. The amount on lower lake docks is 4,800,000 tons. It is believed this ore will have to pay the advance when shipped.

Metallurgical Coke

Coke Prices, Page 53

Stocks of coke acquired in anticipation of a coal strike, April 1, now postponed have weakened the market and buying is depressed. Beehive coke is quoted at $3.60, Connellsville, Pa., for furnace grades, $4.60 for foundry bands and $5.10 on premium foundry.

Shipments at Chicago are steady at the rate established in March. Prices for Chicago delivery are not expected to be increased by the higher freight rates. Cincinnati demand is steady. Competition of coal has caused lowering of the price on domestic coke. Birmingham cokemakers have reduced production slightly as accumulated stocks are heavy. Prices are steady.

Ferroalloys

Ferroalloy Prices, Page 54

New York—Ferromanganese specifications are fairly active and shipments the past few days have been heavier. The market is unchanged at $85, duty paid, Atlantic and gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is $26, Palmerton, Pa., on lots up to 50 tons and $24 on 50 tons and over.

Nonferrous Metals

Nonferrous Metal Prices, Page 54

New York—A stronger tone developed in most markets last week. Straits tin prices advanced rapidly to over 49.50c, export copper rose to over 7.50c and silver reached 61.75c an ounce, duplicating the June, 1928, peak.

Copper—Sales declined during midweek but averaged around 1150 tons daily after fair sales were reported Monday and Thursday. Despite general business and legislative uncertainties, sentiment in the copper trade remained hopeful. Sellers have extended the sales waiver plan through May by which primary producers will give sales preference to custom smelters to the extent of 75 per cent of the latter's sales quotas. Copper and brass mill operations are being well maintained. Electrolytic copper held unchanged at 9.00c, Connecticut.

Lead—Leading sellers equaled their daily ore intakes during most of the week. Prices were firm on the basis of 3.50c, East St. Louis, and 3.65c, New York, with St. Joseph Lead continuing to ask $1 premium on the Eastern market.

Zinc—Prices held steady despite a continued lag in demand. Curtailment of output by prime western producers is in operation and the outlook is for higher prices on any appreciable pickup in buying activity. Prime western held unchanged at 3.90c, East St. Louis.

Tin—Straits tin prices rose sharply on the favorable world statistics for March, on the rapid advances in London and the strength in the pound sterling exchange rate. The market was generally quiet during the week.

Antimony—Prices eased off fractionally despite continued scarcity of Chinese supplies here. Moderate small-lot buying was reported on one or two days. Chinese spot was quoted 14.25c, duty paid.

Aluminum—Prices held steady with ninety-nine per cent plus quoted 19.00c to 21.00c, delivered, in carlots and 22.00c for less than carlots.

Steel in Europe

Foreign Steel Prices, Page 56

London — (*By Radio*)—Improvement is evident in the iron and steel markets of Great Britain. Pig iron demand at Middlesbrough is more active, and contracts have been placed to the end of second quarter. Increased import duties on steel and iron products have strengthened confidence. The steel trade has benefited from orders for more than 80,000 tons of steel rails. The Midlands district is busy on backlogs, but new contracts are scarce. Iron and steel exports are quiet. Tin plate is in fairly good demand but galvanized sheets are dull.

The Continent reports some ner-

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PARISH PRESSED STEEL Co.

Specialists in difficult stamping design

Robeson & Weiser Sts.,

READING, PENNSYLVANIA

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

vousness in the markets, owing to depreciation of the belga. Demand is increasing from Egypt, Palestine, China and Manchuria. France is booking some steel contracts from Russia.

Coke By-Products

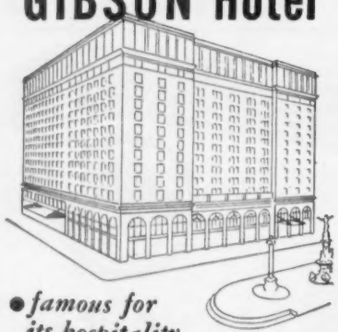
Coke By-Product Prices, Page 53

New York—Xylol and solvent naphtha have been marked up 4 cents a gallon, tank lots, to 30.00c. The price for drum lots is 35.00c. Distillate shipments continue heavy with lacquer makers still specifying. Naphthalene is more active. Phenol is unchanged, having failed to regain slight industrial losses.

FAMOUS LANDMARKS

Washington has the CAPITOL

Cincinnati has the GIBSON Hotel



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RATES

from $2.50 single; $4 double

F. W. PALLANT, General Manager

Quicksilver

New York—Quicksilver sellers report fair business with round lots of 100 virgin flasks of 76 pounds $72.50, a flask and small lots of 15 to 24 flasks, inclusive, at $74. Single flasks are $75.

Men of Industry

(*Concluded from Page* 18)

fully filled many positions until he was appointed auditor in February, 1899. On June 4, 1900, he was elected secretary and a member of the board of managers of Jones & Laughlins Ltd.

Mr. Moreland is now a director, member of the executive committee and vice president of Jones & Laughlin.

♦ ♦ ♦

Dr. H. R. Nelson has been appointed member of the technical staff of Battelle Memorial institute, Columbus, O., to take charge of a research project involving study of the application of electron-diffraction methods to metallurgical problems.

Charles L. Faust has been named assistant electrochemist on the Battelle laboratory staff.

♦ ♦ ♦

A. E. Milbrath, chief draftsman of the Mathews Conveyer Co., Ellwood City, Pa., has been appointed plant superintendent, succeeding the late C. A. Adams.

Lee Sekulski, assistant chief engineer, has been named sales manager, succeeding W. L. Dean, who continues as secretary and treasurer, a position he has held for several years.

♦ ♦ ♦

S. A. Hellings, recently vice president and general manager of the Stewart Die Casting Corp., Chicago, has been elected president. The company is a subsidiary of the Stewart-Warner Corp., Chicago, the president of which until lately had been president of its various wholly-owned subsidiaries.

T. R. Sullivan, secretary-treasurer of Stewart-Warner Corp., Chicago, has been elected a director, succeeding the late Robert J. Graham.

♦ ♦ ♦

H. B. Pulsifer, metallurgist, Ferry Cap & Set Screw Co., Cleveland, has been elected chairman of the Cleveland chapter of the American Society for Metals for the coming year. H. P. Croft, metallurgist, Chase Brass & Copper Co., is the new vice chairman; Gordon T. Williams, metallurgist, Cleveland Tractor Co., secretary-treasurer.

Activities of Steel Users and Makers

THE Sperry Corp. has purchased capital stock and good-will of Waterbury Tool Co., Waterbury, Conn. Capt. Thomas B. Doe, vice president of Sperry Corp., is president of Waterbury Tool Co. Other officers are Lane McLean, vice president; John Sanderson, vice president; D. R. Francis, general manager and chief engineer. The buying will be done by G. A. Foisy. Sales engineering and field work will be handled by A. L. Ellis and Henry Gros. The engineering personnel of the company remains unchanged.

The company will continue the manufacturing of variable speed reversing oil transmissions which have been widely employed in the steel, paper, sugar, machine tool and other industries, in addition to many installations in the United States navy.

♦ ♦ ♦

Yoder Co., Cleveland, manufacturer of machinery for automotive and similar purposes, is operating a third shift and has increased its payroll from 250 to about 300 persons. Among work in hand in addition to equipment for a tube mill at Birmingham, Eng., is a machine for turning out window molding for the Ford Motor Co., brake shoes for Kelsey-Hayes Wheel Co. and other equipment for automobile builders.

Equipment

Pittsburgh—Mesta Machine Co. has been awarded contract for a 79-inch four-high continuous hot-strip rolling mill and four-high cold-strip mills by the National Steel Corp., to be installed at its Great Lakes plant, Detroit. This is the fourth project for which Mesta has furnished equipment, practically identical in quantity, dimensions and detail construction. The first was for Inland Steel Co. and was placed in operation the latter part of 1931. The second was furnished Youngstown Sheet & Tube Co., in operation March 12, 1935. The third is now under construction for Bethlehem Steel Co.'s Lackwanna, N. Y., works.

In connection with the Great Lakes contract, F. A. Mesta, vice president of Mesta, stated: "The approximate amount of material entering into the

mills and auxiliary equipment for each of these units, exclusive of electrical equipment, foundations, buildings, furnaces and cranes, is about 40,000,000 pounds, and the total amount of the expenditures to be made by the steel companies in each case, it is understood, amounts to around $15,000,000 to $20,000,000."

National Steel has awarded other contracts in connection with this project, through its Detroit headquarters. Weirton Steel Co. will furnish the major part of 10,000 tons of structural steel and plates for the mill building which will be erected on the south side of the present bar and strip mills. Capacity of the Michigan Steel Corp. division will be retained for finishing purposes.

Bids on 12 traveling cranes and hoists will be taken April 23 by the Zanesville, O., army engineers, to be installed on eight of the dams now under construction in the Muskingum, O., watershed district. Two cranes will have a capacity of 30 tons each; one of 70 tons; four of 10 tons; one of 6 tons and four of 2 tons.

Chicago—Equipment and machinery business continues in fair volume, considering uncertainties prevalent in the metalworking industry. Machine tool demand, while somewhat less active than earlier in the year, is at a better rate than a year ago, both as regards orders and inquiries. Railroad purchases are light but miscellaneous industries account for a steady volume of small-lot orders. Some additional buying of steel mill equipment is in prospect from local interests, including the American Sheet & Tin Plate Co. and Wisconsin Steel Works.

Seattle—Increasing demand for miscellaneous items, particularly equipment used in gold mining, is noted throughout the Pacific Northwest. Seattle Chain & Mfg. Co. has been awarded 24 hand power drum winches for Fort Peck, Mont.

New York—Orders and inquiry for machinery and plant equipment are not changed materially with the larger part of pending requirements for arsenals in the East still unplaced. After several months delay a few of the several hundred tools bid for technical schools, New York, have been awarded. Most builders selling the export market report volume holding well. Ten tools for a Newark electrical plant still pend. Private industrial demand is scattered with sheet metal working units the most active.

Boston—Operating schedules at most New England machine tool building plants are unchanged with a fair volume of orders, generally for one or two tools at a time, being booked. Bulk of business, however, is for government needs or for activities indirectly connected with public activities. With one or two exceptions textile machinery plants are curtailed. Austin-Nichols Co., Cambridge, Mass., is low on a bending brake for the Portsmouth, N. H., navy yard. Closing April 12, an inquiry for the same shop includes four screw-cutting lathes and a 20-inch drill.

Construction and Enterprise

New England

BROCKTON, MASS.—T. F. Crowell & Sons, Brockton, has the general contract for a 2-story factory addition, 60 x 100 feet, for the Wind Innersole & Counter Co. Inc., 15 Rutland square, and is taking bids on materials. Equipment will include leather working machinery.

HOLYOKE, MASS.—Chemical Paper Mfg. Co. is planning to build a new hydroelectric power plant for mill service, costing about $125,000 with equipment. R. L. Bosworth is manager of power and maintenance department.

PROVIDENCE, R. I. — Interlaken Mills is building an addition to its power plant at Coventry, R. I., and will add turbine facilities. J. F. McCusker, West Warwick, R. I., has the general contract and will purchase materials.

New York

BUFFALO—Whitehead Metal Products Co., manufacturer and distributor of monel metal products, will move April 15 to new and larger quarters at 254 Court street.

NEW YORK—Sedgwick Steel & Iron Corp., Bronx, has been incorporated to deal in iron, steel and metals. Papers were filed by Michael Rechler, 305 Madison avenue.

NEW YORK—Incorporation papers for the Montauk Iron & Steel Corp., to manufacture iron and steel products, were filed by J. Leon Friedman, 11 West Forty-second street.

New Jersey

CAMDEN, N. J.—Sears, Roebuck & Co., Arthington and Homan avenues, Chicago, is reported to be reopening its plant here, which previously manufactured enameled ware.

Pennsylvania

CORAOPOLIS, PA.—Bids will be received at the office of W. E. Cain, borough secretary, Municipal building, until April 16 for two single-stage, double suction, horizontal, horizontally split centrifugal pumps, to deliver 1000 gallons per minute against a total head of 250 feet, with motors attached.

EAST PITTSBURGH, PA.—Westinghouse Electric & Mfg. Co. has received a contract from the navy department amounting to approximately $1,750,000 for electrical equipment for eighteen 1500-ton destroyers. This equipment will be manufactured at the East Pittsburgh, South Philadelphia, and Newark, N. J., plants of Westinghouse.

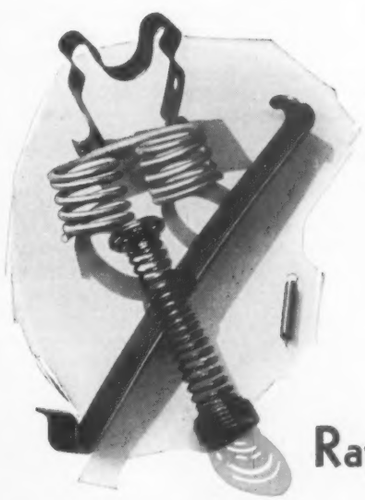
LEBANON, PA.—Lebanon Mills Inc. has completed plans for construction of an addition to its plant here to cost about $150,000 or more with new machinery and equipment. The new unit will provide approximately 20,000 square feet of additional floor space.

YORK, PA.—York Ice Machinery Corp. has received a $1,000,000 order for air conditioning equipment for the Department of Interior building, Washington.

YORK, PA.—York Ice Machinery Co. has received an order from the Central

RAYMOND

Springs



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Mining & Investment Corp. for installation of an air conditioning system in the East Rand mine at Johannesburg, South Africa. The equipment will supply 150,000 cubic feet of cooled air per minute to the workers in the mine.

Ohio

AKRON, O.—Johnson Steel & Wire Co., Worcester, Mass., is negotiating for an Akron branch site in DeValera avenue-Hogue avenue area, adjoining the Baltimore & Ohio railroad property. If plans go through the company will erect a plant immediately.

DAYTON, O.—War department, air corps, Wright field, will open bids April 15, circular 35-628, on approximately 15 tons of sheet iron, 83,600 wrought iron bolts, 83,600 wrought iron washers, 83,600 lead washers, and 16,000 strap galvanized fasteners, delivered at Bay Ridge, L. I.

NILES, O.—Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is preparing plans for the city of Niles for a new city-owned electric light and power plant.

YOUNGSTOWN, O.—Republic Steel Corp. is taking bids on a single stand four-high cold tin plate mill for installation at its Warren, O., plant. Estimated cost with auxiliaries is $300,000.

YOUNGSTOWN, O.—Carnegie Steel Co. is constructing a new boiler house costing between $750,000 and $1,000,000 at its Ohio works here. The new boiler house, to be known as No. 9, will be built alongside the No. 8 boiler house. Carnegie will also replace some of the old equipment.

ZANESVILLE, O.—United States engineer, First National Bank building, will receive bids April 23, contract 32, for traveling cranes and hoists, trolleys and chain hoists, trolley and electric hoist.

ZANESVILLE, O.—East Ohio Gas Co., Cleveland, will take bids through Maj. J. D. Arthur Jr., Zanesville, O., army engineer, April 19 for the relocation of its pipe line in the Tappan reservoir site. Successful contractor will construct an embankment and bridge and will require approximately 50 tons of structural steel and reinforcing steel.

Michigan

ADRIAN, MICH.—Adrian Mfg. Co. has been organized by W. A. Chick to manufacture replacement springs for the automobile and motor truck jobbing trade. The company has leased quarters in a plant on East Beecher street and has purchased the factory equipment of the former Adrian Spring Co.

DETROIT — National Steel Corp., Grant building, Pittsburgh, has awarded contract to Mesta Machine Co., West Homestead, Pa., for construction of continuous hot and cold strip mill at its Great Lakes division here. (Noted March 11).

PORT HURON, MICH. — Mueller Brass Co. plans installation of motors and controls, conveyors, etc., in proposed new addition to brass and bronze products plant. Cost over $150,000.

Illinois

ALTON, ILL.—Capt. B. M. Harloe district engineer, war department, 428 Custom house, St. Louis, will receive bids until April 11 for construction of dam No. 26 in the Mississippi river to cost approximately $3,500,000. Equipment and material involved will include 5355 tons of structurals for service bridge, roller gates, tainter gates, etc., 1320 tons of concrete reinforcing, 240 tons of chromium steel, 350 tons of structural steel forged eyebars, 137 tons of alloy steel forgings, 297 tons of grade 2 steel castings, 125 tons of non-skid steel floor plating, two locomotive cranes on service bridge, and other equipment.

CHICAGO—Mac Corp., 4510 West North avenue, has been incorporated to manufacture and deal in screw machine products, by James McMahon, John T. McMahon and Mary McMahon. Correspondent: Pennish & Rashbaum, 100 South Dearborn street.

CHICAGO—Olson Rug Co., 2800 North Crawford street, is planning to erect a new power house at its mill in connection with the 6-story factory addition. Cost over $150,000, including motors and controls, regulators, conveyors and other electrical equipment for mill service. Weiss & Niestadt, 343 South Dearborn street, architects.

STERLING, ILL. — Northwestern Barb Wire Co. is planning to install heavy-duty motors and controls, regulators, transformers and accessories, conveyors and other equipment for expansion and improvements in plant, including erection of new rod mill. Cost is estimated at close to $3,000,000.

VILLA PARK, ILL.—Wander Co., 180 North Michigan avenue, Chicago, is installing motors and controls, conveyors, hoists, etc., in the new addition to its malt products plant here. Cost close to $200,000.

Indiana

ANDERSON, IND.—Greer Steel Co., Dover, O., has announced that preliminary work will be started this month on erection of new manufacturing unit here to produce strip steel. (Noted Jan. 14).

INDIANAPOLIS—Plans for additions to the shipping department, stockrooms, offices and experimental laboratories of the Schwitzer-Cummins Co., 1125 Massachusetts avenue, have been announced by Louis Schwitzer, president.

INDIANAPOLIS—L. & O. Metal Products Co., 232 Caven street, has been incorporated and will specialize in noncorrosive metal work. The company will fabricate monel metal and stainless steel tanks and equipment, along with general sheet metal work and welding. R. B. Laws is president and general manager.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 12, schedule 4639, for one steel tank delivered at Thorne, Nev.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids April 16, schedule 4656, on diesel engine driven generators and spare parts.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids April 19, schedule 4733, for three motor-driven buffing and polishing machines, delivered at Portsmouth, N. H.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids April 12, schedule 4662, for one motor-driven, vertical, all-geared drill, delivery at Portsmouth, N. H.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids April 16, schedule 4612, for 16 electric portable pumps, delivery at Sewall's Point, Va.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 12, schedule 4625, for motor-driven, geared-head, screw cutting lathes, delivery at Portsmouth, N. H., and Mare Island, Calif.

WASHINGTON—Chief, bureau of yards and docks, navy department, will receive bids April 10, specification 7893, for two steel radio towers and a steel mast for the navy yard at Brooklyn, N. Y.

WASHINGTON—Commissioners, room 427 District building, will take bids April 22, for constructing unit No. 2 of sewage treatment plant, consisting of grease separating tanks, sedimentation tanks, plant by-pass, etc., to cost approximately $900,000.

WASHINGTON—Construction service, veterans administration, Arlington building, will take bids April 16 for steel shelving for 15 buildings for the veterans administration facility at Danville, Ill.; also will take bids April 23 for new boilers and boiler plant equipment for the veterans administration home in Virginia.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids April 9, schedule 4627, for electric motors and controllers; April 12, schedule 4655, one motor-driven, high-speed, floor-type, vertical, single-spindle drilling machine, and one motor-driven, floor-type, vertical, high-speed, sensitive drilling machine, delivery at Philadelphia.

Kentucky

NEWPORT, KY.—Newport Rolling Mill Co. will build an inclined pump track on Licking river. It will be supported on steel framework and concrete piers.

Alabama

TUSCALOOSA, ALA. — Gulf States Paper Co. has moved its 50-ton pulp mill here from its plant in Louisiana, and is planning to expand capacity.

Maryland

SALISBURY, MD.—City, Clark Gardner acting city clerk, has plans in progress for erection of a steel elevated storage tank.

Georgia

ATLANTA, GA.—Southern Dairies Inc., 60 M street Northwest, Washington, is having plans prepared for a concrete and steel dairy products plant to be erected here at Glenn Inn and North avenue.

SAVANNAH, GA.—Savannah Electric & Power Co. has been granted permission to install, operate and maintain an electric distribution system.

SAVANNAH, GA.—Union Bag & Paper Co., 15 Exchange place, Jersey City, N. J., will build a $4,000,000 plup and paper plant and bag factory here, to make paper from slash pine. A 40,000-acre perpetual forest will supply raw material for the new plant. Alexander Calder is president.

Mississippi

CRYSTAL SPRINGS, MISS.—Wiley Grantham is erecting a packing plant, 40 x 160 feet, and will install modern equipment.

CRYSTAL SPRINGS, MISS.—W. D. Garland is building a packing plant, 40 x 100 feet, at 51 Highway street.

Florida

BARTOW, FLA.—Atlantic & Gulf Canning Co. has been organized by P.

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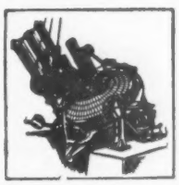

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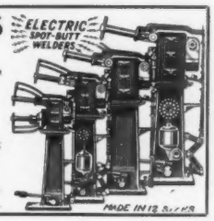

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M. Childers and M. F. Preston, to operate a canning and packing plant.

PENSACOLA, FLA.—Pensacola naval air station has received authorization from Washington to spend approximately $3,000,000 for improvements, including barracks and mess hall, assembly and repair shop, general storehouse and hangars.

TAMPA, FLA.—Lyons Fertilizer Co. is planning installation of motors and controls, electric hoists, conveyors, loaders and other equipment in connection with proposed rebuilding of commercial fertilizer plant recently damaged by fire.

North Carolina

BURLINGTON, N. C.—Tower Hosiery Mills plan installation of motors and controls, conveyors, etc., in the new addition to its knitting mill. Cost about $125,000.

GREENSBORO, N. C. — Southern Packing & Canning Co. has been incorporated with $125,000 capital by W. C. Shaw and G. R. Shaw, 609 Asheboro street.

THOMASVILLE, N. C.—Grimes Lumber Co.'s machinery department recently suffered damages by fire.

Tennessee

FRANKLIN, TENN.—Dortch Stove Works, manufacturer of cooking and heating stoves and ranges and parts has plans for a 1-story addition, totaling about 12 000 square feet floor space, primarily for storage and distribution. Cost close to $25,000 with equipment.

NASHVILLE, TENN.—City will take bids for erection of an incinerator as soon as plans are approved by PWA. C. N. Harrub Engineering Co., engineer, 711 American National Bank building.

PIKEVILLE, TENN.—Boiler room and electric light plant at the Agriculture and Training school for negro boys recently sustained damages by fire.

West Virginia

CAMDEN, W. VA.—Mountain State Transportation Co., Point Pleasant, W. Va., expects to build a coal loading tipple on the left bank of the Ohio river near here.

PARKERSBURG, W. VA.—Standard Oil Co. of New Jersey, 30 Rockefeller Plaza, New York, will rebuild three loading platforms on the right bank of the Little Kanawha river at Parkersburg.

Virginia

NORFOLK, VA.—Treasury department, procurement division, public works branch, Washington, will open bids April 22 for air conditioning equipment for the Marine hospital here.

RICHMOND, VA.—Phillip Morris Co. Inc., Twentieth and Main streets, Wirt H. Hatcher manager, has let contract for $100,000 addition to its plant. An air-conditioning system will be installed.

Arkansas

EUDORA, ARK.—White Mfg. Co. is erecting a saw mill here.

Oklahoma

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co. is arranging appropriation of $755,700 for extensions and improvements in power plants and system in 1935, including transmission and distribution lines, power substations, service facilities and miscellaneous work.

Texas

BEAUMONT, TEX. — Considerable equipment at the refinery of the Magnolia Petroleum Co. here was damaged by fire April 2.

Wisconsin

WASHBURN, WIS.—Bayfield county, Ludwig Tranmal county clerk, plans construction of a 1-story county garage and maintenance shop, 24 x 110 feet.

Minnesota

MINNEAPOLIS—Palm Mfg. Co., 515 West Lake street, has been incorporated with capital stock of $25,000 to manufacture mechanical refrigerators, by John R. Palm, C. H. Palm and Catherine Ellis.

Iowa

CEDAR RAPIDS, IOWA—Penick & Ford has awarded contract for construction of a 1-story addition to bulk starch packing plant, to cost $50,000. Total cost of improvement work at the plant now amounts to $130,000.

DES MOINES, IOWA—New Monarch Machine Co., 401 Southwest Ninth street, is expanding facilities at its plant, and is in the market for a seven-cubic foot air compressor and other equipment.

DES MOINES, IOWA—Bookey Packing Co., Harry Bookey president, has awarded contract for construction of an addition to its packing plant, 44 x 47 feet, to cost $35,000, including a new killing room and a new department and equipment for producing meat meal.

IOWA CITY, IOWA—City council has purchased 32 acres at a cost of $18,800 as the site to construct a $516,000 sewage disposal plant. Construction will start immediately.

Nebraska

NORTH PLATTE, NEBR.—Platte Valley public power and irrigation district, Gerald Gentleman secretary, will receive bids until April 12 for approximately 300 miles of transmission line equipment and accessories, being part of the $7,500,000 diversion dam and hydro-electric development project.

Missouri

BLAND, MO.—City will take bids April 12 for waterworks and sewer systems, for which PWA has allotted a grant and loan of $70,000.

KANSAS CITY, MO.—General Motors Corp., General Motors building, Detroit, has acquired a site between Ewing avenue and Kansas City Southern tracks, from Thirty-ninth street to Fortieth street, for erecting a parts depot building and space expansion for the Chevrolet assembling plant in the Leeds district.

ST. LOUIS—Scharff Koken Mfg. Co., 7901 Michigan avenue, has awarded contract for 1-story factory addition, costing $10,000.

ST. LOUIS—Mid-Continent Quicksilver Mining Corp., recently organized to take over holdings of the Arkansas Quicksilver Co., has begun operations, and will install a new 50-ton crusher and retort as soon as 6000 tons of ore have been raised. N. H. Bencheidt, Hutchinson, Kans., is president.

ST. LOUIS—J. M. Dunham, Chemical building, architect, is preparing plans for a factory building for a client. Plans include construction of four separate buildings for factory and warehouse, and power plant, 70 x 155 feet. All buildings are being equipped with automatic sprinklers and special heating and air conditioning systems.

Wyoming

CASPER, WYO.—Casper chamber of commerce is interested in the development of a deposit of titanium discovered in the Iron Mountain district, which it is hoped will be developed with power from the Seminole dam of the Casper-Alcova project.

Montana

MISSOULA, MONT.—Northern Pacific Transport Co. is rebuilding a former boiler manufacturing shop, 32 x 190 feet, into a bus and truck terminal. The terminal will accommodate ten buses and trucks and will include a machine shop, maintenance garage, inspection pit, etc.

Idaho

MOSCOW, IDAHO — Latah Grain Growers Inc. is asking bids for additions to its warehouses in Moscow and Joel, Idaho, to increase present capacity by one-third. H. H. Simpson is manager.

Arizona

GLOBE, ARIZ.—City plans new electric light and power plant, including electrical distribution system. PWA fund of $150 000 is being arranged. Mayor W. A. Sullivan is active on the project.

Pacific Coast

LOS ANGELES—Crane Co.'s plumbing warehouse, 321 East Third street, recently was damaged by fire.

LOS ANGELES—W. I. Hollingsworth building, Sixth and Hill streets, E. G. Carter, manager, will undergo rehabilitation at a cost of about $100,000. Otis Elevator Co. has been awarded contract for complete replacement of elevator system.

LOS ANGELES—United States Spring & Bumper Co., John B. Rauen, president, East Fiftieth street and Vernon, has a $100,000 construction program under way, which will add three additional units to its plant, to be completed by May 1. Structures include a manufacturing unit, an electrical equipment housing unit and a new locker building.

LA CONNOR, WASH. — McMillan Bros. are constructing a 2-story warehouse addition to their cannery plant.

METALINE FALLS, WASH.—Lehigh Portland Cement Co., Allentown, Pa., has awarded contract to S. G. Morin, Spokane, for improvement to its local plant, costing $50,000. Plans call for 12 reinforced concrete bins. A new grinding mill will also be installed. W. G. Perow is district manager.

SEATTLE—City officials will receive bids April 18 for furnishing one 10,000-kilowatt transformer and oil circuit breakers for city light department.

ST. JOHN, WASH.—St. John Tractor & Equipment Co. has been incorporated with $10,000 capital by Charles E. McSweeney and associates, National Bank building, Colfax, Wash.

VANCOUVER, WASH.—Legislature has appropriated $46,500 for construction of a district highway headquarters, $14,500 for water system, $40,000 for dormitories and $25,000 for a heating plant at the state school for blind and deaf here.